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THE BAKERS' GUIDE

AND

STUDENTS' MANUAL

AN ASSISTANT TO THE THEORY AND PRACTICE OF BREADMAKING, FLOUR, CONFECTIONERY, SUGAR CONFECTIONS AND CATERING

BY

JOHN BLANDY

Certificated Teacher of Breadmaking; Founder and Past Principal of the Borough Polytechnic School for Bread and Confectionery Making; Holder of City of London Guilds' Honours Diploma for Breadmaking; Editor of the "Bakery World," and other well-known works.

FIFTH EDITION

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LONDON
THE BAKING AND CATERING BUREAU
190 FLEET STREET, E.C.
1903

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17

The Great Gathering

— OF —

The Trade.

1964283

Confectioners' and Bakers'

Exhibitions are held annually

during September.

FOR PROSPECTUS FOR SPACE

APPLY TO

W. E. AYLWIN

MANAGING DIRECTOR,

PALMERSTON HOUSE, OLD BROAD STREET,

LONDON, E.C.

See Page 222.

Blandy's "Textis"

(REGISTERED)

Invented and Prepared by

Mr. JOHN BLANDY

Certificated Teacher of Breadmaking; Founder and Past Principal of the Borough Polytechnic School for Bread and Confectionery Making; Holder of City of London Guilds' Honours Diploma for Breadmaking; Editor of "The Bakery World," "The Bakers' Guide," and other well-known works.

SPECIAL POINTS

No Waste. No Mess. No Uncertainty.
No Cost for Packages.
No Empties to Return.

A FREE TRIAL SAMPLE

will be sent on application.

PRICES.

The cost of "TEXTIS" to the regular user works out at—

£2 9s. 6d.

per cwt., Carriage Paid.

Full List of Prices and Special Terms can be had on Application.

Blandy's
"Textis" Co.,
190 Fleet Street,
LONDON, E.C.

Telephone: 3682 Central.

(See opposite page.)

What is Guaranteed!

TEXTIS
will improve the appearance, bloom, texture, and quality of your bread.

TEXTIS
will increase your reputation as a maker of attractive, palatable, and digestible bread.

TEXTIS
will add greatly to the food-value of any flour. It will mellow it, and render all its constituents more palatable and nourishing.

TEXTIS
will not only increase the bread yield per sack of flour, but cannot fail to make better bread in every way.

TEXTIS
will strengthen the activity, fermenting, and reproductive power of your yeast.

TEXTIS
is not an adulterant, but a concentration of the finest food elements known to dietetic science.

TEXTIS
will fulfil all the above conditions, and bears no resemblance to any other preparation in the market.

Advantages.

BLANDY'S "TEXTIS," being a dry powder and not a liquid, it will increase the weight of the dough by its own weight of concentrated foodstuffs, and return, in money value of the bread produced, more than it costs.

Its use is simplicity itself. It can be handled, weighed, or measured with ease and celerity, thereby ensuring uniformity, so difficult in the case of liquid preparations.

NOTE.—All other preparations, yeast stimulants or diastasic agents, such as bread-improvers, liquid extracts, potatoes, sugar, etc. (excepting, of course, yeast and salt), can be dispensed with, as Blandy's "Textis" takes the place of them all.

The Best Way of Using "Textis"

"TEXTIS" will suit any process, and can be put in at the time most convenient to any particular way of working, either in the flour, with the yeast, in the sponge, or in the straight dough. Whatever method is adopted it should be mixed in well. To get the best results Mr. Blandy recommends the following formulæ:—

> NOTE.—In these formulæ the normal quantity of water per sack is given, viz., 140 lbs. water to 280 lbs. flour. It must be observed, however, that the quantity of **WATER MUST BE INCREASED**, or the amount of **FLOUR DECREASED**, in consequence of the highly absorbent effect of "Textis" upon the flour, and according to the varying style—pan, batched, or cottage. The foreman's experience will guide him in this matter, and will be safer to follow than anyone's written opinions.
>
> The same remark will apply to the temperature at which the water should be taken up, the character of the flour used, the temperature of flour and the bakehouse being unknown. Further, the style of working the dough off will greatly affect this question of temperature. For instance, in some cases the dough is very slowly worked into the oven, in others it is "hey, presto," and into the oven very smartly, and in this latter case the dough will need to be more ripe than in the former. There is, too, the question of whether it is kneaded in a mixer and afterwards in a divider and weigher. When this is the case the experience of the foreman will count as the paramount factor, for though these dividers and weighers are all of them undoubted blessings to the Trade, the particular effect they exert upon the dough will have to be known before the work they perform will be just what is required to perfect and not retard the quality of the loaf. The experience of the foreman must be the guide as to the best way to work the dough to meet the great alteration in the manipulation. The danger at the moment, as far as my own experience goes, is in the direction of overmuch breaking up of the tissue of doughs, holes and unevenness resulting from over-manipulation. This should be guarded against in the early workings.—J. B.

METHODS.

Straight Dough.

To each 280 lbs. of flour add 1 lb. "Textis," ¾ lb. distillers' yeast, 4½ lbs. salt, and 140 lbs. (56 quarts) of water, and make up into dough. Give the dough plenty of room in the trough, and let it remain to aerate twelve hours, then knead it well together, table and scale off.

Sponge and Dough.

Use the same quantities; stir a firm sponge with half of the water, the yeast, the "Textis," and 2½ lbs. of salt; leave to aerate twelve hours, and then add the remainder of the water and salt. Break up the sponge, and with the remainder of the flour make into dough. Leave it to aerate one hour, table and scale off.

Ferment and Dough.

Use the same quantities. Put into ferment the yeast, "Textis," 12 quarts of water at 90 degrees Fahr., and 10 lbs. of flour. Mix and let stand for two hours. Add the salt and remainder of flour and water at 80 degrees Fahr., and make into dough. Let the dough remain to aerate six hours. Table and scale off.

Six Hours' Straight Dough.

1½ lbs. yeast, 3½ lbs. salt, 1 lb. "Textis," 280 lbs. flour, 140 lbs. water at 96 degrees Fahr., make the whole into dough, and leave to aerate six hours, then knead together, table and scale off.

Six Hours' Sponge.

Stir a clear sponge with 1 lb. yeast, 1 lb. "Textis," half of the water 90 degrees Fahr.; let aerate about six hours, and then make into dough, with the remainder of water and flour and 3½ lbs. salt. Let the dough lie two hours, table and scale off.

(*See overleaf.*)

A Simple Scientific

EXPERIMENT

Why "Textis" is the Cheapest as well as the Best. . . .

The question has been asked—How do you prove the statement that "Textis" returns to the Baker, in money value of the bread produced, more than it costs? There are three points to be considered.

FIRST.—"Textis" is a dry powder and not a liquid, and therefore increases the weight of the dough by its own weight of concentrated foodstuffs.

SECOND.—"Textis," instead of containing a high percentage of water, as is the case with all Liquid Extracts, is itself a great absorbent, and further, **flour in which "Textis" is incorporated is not only rendered much more absorbent, but its water-retaining quality is greatly increased.** For every cwt. of "Textis" used, at least 68·87 lbs. extra water is required, and this water is got out of the tap for nothing. It follows, necessarily, that the bread produced must be more moist, and its keeping quality greatly increased.

In trial batches, which many large firms who are using "Textis" have made, this valuable water-absorbing and retaining quality has been most marked, for the bread has always been fresh and palatable long after the period usually allotted to the life of a loaf.

It will be apparent, therefore, that this highly absorbing effect of "Textis" must be met by the use of as much additional water as is convenient for the mode of working.

THIRD.—The appearance, bloom, texture, and quality of the bread produced with "Textis" is much superior to the ordinary loaf. "Textis" will enhance the appearance of the bread made with the highest grade flour in the world. It will, therefore, hardly be necessary to add that its beneficial effects upon low grade flour are most remarkable. A great number of bakers in poor class districts, where only the cheapest flour on the market can be used, have adopted "Textis" on this one virtue alone. The dietetic value of bread made with "Textis" is especially notable. In fact, as a result of numerous experiments, it has been proved that bread containing "Textis" is much superior in its proteid and flesh-forming matter to all white breads and the best brown breads on the market. Chemical analysis has demonstrated beyond dispute that it contains more tissue-forming elements than any of them. This fact is incontrovertible.

Add these three facts together, and by a simple process of reasoning it will be found that "Textis," instead of being an expensive luxury, actually costs nothing, returning, as is claimed for it, more than it costs in the money value of the bread produced.

Try this Simple Experiment.

To 6½ ozs. "Textis" add 4 ozs. water. The result will be the consistency of a normal dough. Therefore every pound of "Textis" requires at least 9·84 ozs. of water extra, so that in using 1 cwt. of "Textis" the baker is adding to his flour 112 lbs. of concentrated foodstuffs, and not less than 68·87 lbs. of extra water.

When it is remembered that Liquid Extracts contain from 30 to 60 per cent. of water, it will be evident that not only is "Textis" the best article on the market, but it is also the cheapest. Its cost is practically nil, when the extra yield and quality of the bread that results is taken into account.

In short, among all Bread Improvers, "Textis" is not only the **best**, but the **cheapest**.

(See the two previous pages.)

THE BAKING AND CATERING BUREAU.

This Office is established for the purpose of providing sound, practical advice regarding everything connected with the

Baking, Catering, Confectionery,
Sugar Boiling and Milling Industries,

and all departments of commerce associated with them.

The Bureau has retained the services of not only the best known, but the most highly qualified and reliable specialists engaged in every branch of these trades. In thus concentrating the best "brains" employed in these industries, the Bureau is able to offer most exceptional facilities

For Advice and Guidance
on Moderate Terms.

The Baking and Catering Bureau is designed to furnish disinterested advice and authoritative opinion based upon facts, and under no circumstances can the use of any reports, tests, analyses, or other information emanating from this Office be permitted for publication or advertising purposes, except by special arrangement.

ADVISORY BOARD.—The Advisory Board comprises the leading Specialists in every department of the Baking, Catering, Confectionery and Milling Trades, including Mr. J. Blandy, Certificated Teacher of Breadmaking, Founder and past Principal of the Borough Polytechnic School for Bread and Confectionery making, holder of City of London Guilds' Honours Diploma for Breadmaking, Editor of "The Bakers' Guide," "The Bakery World," and other well-known works.

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What to Make, and how to make it.

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190 FLEET STREET, LONDON, E.C.

CORRESPONDENCE INVITED.

[redacted]

PREFACE

No man knows the whole art of Bread-making, but each man knows, or ought to know, his own corner.

These words I used a few years ago, in writing on a special subject, and probably no one will dispute them.

But it is said that every rule has its exception; and if I could acknowledge an exception in this case, it could only be in the person of Mr. John Blandy. He has explored so many corners, and his grasp of their various problems is so complete, that I hold him to be pre-eminently qualified to instruct and advise those who may be anxious to learn or to perfect themselves in any branch of this ever-varying art.

I speak from experience: many a lesson and many a hint have I gained from him. And I can confidently advise any who may stand in need of information to take Mr. Blandy's book for their guide and friend.

BENJAMIN J. WILLIAMS.

EDENDERRY, *May, 1903.*

INTRODUCTORY NOTE

The boys and girls of yesterday will be the men and women of to-morrow. Youth in constant progression is ever passing away. The young and the inexperienced workers who saw the advent of the first edition of "The Bakers' Guide" are now neither as young, nor inexperienced, let us hope; but others as youthful, and with as much to learn, have taken their places.

It is as much for these—the new generation of learners—as for the assistance of the practical business man, that the issue of the fifth edition of this book is intended. It is hoped that it will not only assist the present-day student of the Baking Trade, as it may have done his predecessor, but that it may be of some service to those who are engaged in the many Technical Schools now in existence, particularly in the preparation of examination papers. I may point out that, with this end in view, a certain amount of the matter in the succeeding pages has been cast in "Question and Answer" form. It is hoped, too, that the re-issue of "The Bakers' Guide" will not be without its influence in carrying forward another stage the education of bakers, confectioners, and caterers generally.

As far as the writer's ability to do so has allowed it, the whole of what remains of the old matter, both theoretical and practical, has been brought up to date, and incorporated with the new.

The desire for studious reading is not innate in the bulk of young people, or, in fact, among the great majority of people at any age. The appetite for study is rather a faculty to be cultivated by those who till the fallow soil of the human mind, and sow the seed of the desire for knowledge in it.

With the passing of the old generation of bakers, confectioners, and millers, there passed away the stigma attaching to these trades as non-readers of their trade literature. The duplicated editions of the many reference books and journals printed for their special information amply prove that the present members of these trades are now earnest students of the varied reading matter appertaining to their business; and my aim, particularly in connection with the fifth edition of this book, has been guided by the desire to still further stimulate the appetite for reading, not only the efforts emanating from my humble pen, but those provided by the abler pens of other teachers—the leaders of the Trade. Read and think! read and think!

JOHN BLANDY.

London, *June, 1903.*

MILLENNIUM
FLOUR
WON THE "MILLER"
50 GUINEA
SILVER CUP
ENGLISH V. HUNGARIAN.
LONDON
INTERNATIONAL
EXHIBITION
1899
LIVERPOOL
LBS
Millennium
FLOUR
None genuine except in Bags branded as above

THE FOLLOWING QUESTIONS

ARE ASKED OVER AND OVER AGAIN:

What is Millennium Flour?

ANS.—The purest Flour known; that means that it is the pure Kernel of the Wheat Grain, purified by gravity, and scientifically reduced so as to be absolutely free from all impurities.

What advantage is there in this Flour being made from the WORLD'S BLENDED WHEATS?

ANS.—It is well known that each season's Wheat differs in quality; one season America will have a good harvest, and another season India or Russia, or Argentina, or Australia will likewise in their turn have good harvests, causing the Flours of the different countries in their good seasons to excel.

MILLENNIUM FLOUR is made from a selection of the best harvested Wheats of the World in any given year.

How is this distinguished in the Flour?

ANS.—Flour made from well-harvested Wheat always possesses a clean, bright, bloomy appearance, and will never have a greyish or pale white, sickly look.

Why is this very fine Flour better than the darker and coarser kinds?

ANS.—No Flour would be dark unless it was made from inferior kinds of Wheat, was badly milled, or had in it impurities of some kind. Inferior kinds of Wheat frequently contain small stones, dirt, seeds, smut, &c., some of which get into the Flour, causing a dark colour in consequence.

Why is the Flour termed MILLENNIUM?

ANS.—Because the MILLENNIUM is a state in which all rivalry ceases, and this Flour. being unrivalled, is termed MILLENNIUM, having arrived at an eminence where there is no further competition.

THE BAKERS' GUIDE

MACHINERY APPLIANCES AND STAFF.

The practical utility of Machinery in the Baking and Allied Trades is now universally acknowledged.

Q. State the kind of capacity of the machines and power required for loaf bread, baker having an output of from 70 to 100 bags (140 lbs. each) of flour per week.

A. One dough mixer of three bags of flour capacity, one flour sifter, and one weigher, all attached by belting and shafting to a nominal 4-horse-power engine.

Q. What other fittings and utensils are necessary?

A. One 20-gallon tempering and measuring tank, connected with hot and cold water supply; two troughs on rollers for dough, large enough to permit 600 lbs. of dough to aerate freely; one moulding or other table, measuring 12 ft. by 5 ft.;

> *Note.*—If the floor space does not permit of sufficient room for men to work both sides of the table, it may be reduced to 3½ ft. in width, but this reduction in width must be made up by adding to the length, as the surface area, however cut up, should not be less than 60 square ft.

two racks on castors fitted with movable boards for conveying the dough to the oven;

> *Note.*—If the floor space is too limited to permit of these racks being freely moved about, their place may be taken by twenty-four boxes, of an inside measurement—20 ins. wide, 30 ins. long, and 6 ins. deep for holding the moulded dough. As each box is filled it may be covered by another. In this way the bottom of the uppermost becomes the cover of the one underneath. Another and very convenient space-saving arrangement is to place the tables or working boards against the side or sides of the bakehouse. In this case the

working boards should rest upon partitions, 20 ins. apart, inside measurement, each partition having upon either side of it, fillets, or pieces of wood or iron, to support sliding shelves for carrying the moulded loaves. The entire front should be covered in by sliding doors on rollers, so that a more or less air-tight proving cupboard is provided, which should be especially useful to those bakers whose system of working involves the proving of the moulded dough sometime before being put into the oven.

In addition to these boxes, or proving cupboards, it will be necessary to provide about twenty-four wooden trays, 22 ins. wide, 34 ins. long, with sides 3 ins. deep, outside measurements, for conveying the baked bread away from the ovens. These carrying trays should be made as light as possible, but strong enough to resist ordinary wear in usage.

One sack trolly; four peels, two of which should have small heads for setting the bread, and two large and strong for taking it out; one or two scales and sets of weights; one large thick knife, and one small for cutting up large and small pieces of dough; two dough scrapers, two hand brushes, and one long-handled broom, and one bold-faced clock.

Note.—If the loaves are baked in pans, the requisite number of the latter must be added to this list, and shelving or cupboards provided for their storage when not in use.

Q. State the surface space of the sole of the baking chamber required for an output of this quantity of bread. (70 to 100 bags of 140 lbs. each, per week.)

A. One hundred and fifty square feet of baking surface. This should be divided into two or three ovens (baking chambers), as, for convenient working, two small ovens are preferable to one large one, and three small or two ovens of medium size.

Q. What well-known and standard types of ovens are now in use? Explain briefly the differences in the system of construction and heating.

A. There are five types of ovens, which may properly be described as standard and well known.

Two are heated internally, or partly so, as well as externally. These are fired and heated, some with coal and some with coke, the fire being entirely or partly in direct communication with the baking chamber, the products of combustion entering into the baking chambers. These ovens are mostly built in solid brickwork, and are provided with a stone or tiled sole, upon which the bread is baked.

Two are externally heated. The products of combustion in these cases do not enter into the baking chambers. Both are fired and heated with coke. The two systems of construction

may be described in this way: In the first type the heat from the fire is conveyed over, under, and around the baking chamber by a series of flues, channels, or hot air compartments. In the second, pipes are employed. These pipes or tubes are each hermetically sealed, and contain a certain quantity of liquid. They are fixed an inch or two apart, over the top, and under the bottom surfaces of the baking chamber, the ends being in direct and close contact with the fire, piercing the wall partitioning off the baking chamber from the fire-box or furnace, and extending over the whole fire space. These pipes or tubes and the enclosed liquid become uniformly heated through their whole length. These types of ovens are constructed generally of brick, in some cases stone, in others entirely of metal, and in some instances both steel and stone is used.

The fifth standard type is the gas oven. When these ovens are constructed for cake or bread-making purposes, the live flame is not allowed to enter direct into the baking space. The heat is conveyed chiefly by conduction and radiation throughout a space dividing the inner chamber from the outer wall or framework of the oven, between the outer framework and the space parting off the inner baking space. This space is packed with asbestos or other material, to prevent the loss of heat by its escaping through the outer wall into the surrounding atmosphere.

Q. Which of these is considered the best oven for loaf-baking purposes?

A. None of these types can fairly claim to be the best. That type of oven is the best which the individual working it understands the best, and out of which he gets the best kind of work owing to his knowledge of the way to use it.

An oven is an oven, and if properly constructed it will bake or cook properly that which is placed within it: that is to say, if the heat of the oven is at the correct temperature required to bake the particular class of goods placed in it, the result will be satisfactory, but if it is not heated to the temperature necessary to the class of goods to be cooked, the contrary will be the result, and the fault will be the user's, and not the oven. An oven must be manipulated according to the particular kind of duty it has to perform.

There are many of all these types of ovens in constant use. Which is best will depend upon the views of the people using them.

There are ovens heated by electricity also in use, but they cannot be classed as standard, being as yet only in the experimental stage.

Q. Does the baking of flour confectionery require an oven to be specially constructed for that class of work?

A. No. The only difference between the baking of bread and

the baking of confectionery is that there is a wider range of temperature employed for confectionery than in the case of bread. Therefore it is more a matter of adjustment of temperature by the operater than of construction of oven.

Q. If the output is 400 bags (140 lbs. each) of flour per week, what then will be the nature of the plant and baking accommodation necessary?

A. A 6-horse power nominal engine, a four bag mixer, a 30-gallon tempering and measuring tank, six dough troughs, one hundred square feet of tabling, two hundred and fifty square feet of oven-baking space, one loaf dough divider and weigher, three carrying racks, or a sufficient number of carrying trays and proving boxes or cupboards.

> *Note.*—If the output is thousands instead of hundreds of bags of flour per week, the same kind of plant and utensils will be necessary, but increased in capacity.
>
> No mention has been made of dough brakes, sponge stirrers, potato washers, strainers and mashers, fermenting tubes, or sack hoists. These are not necessities, except under certain systems of manufacture.

Q. If "Vienna" bread and rolls are also made, what other plant will be necessary?

A. A boiler for generating steam.

> *Note.*—The chief characteristic and virtue of "Vienna" bread is a glazed baked crust or outside surface. This is produced by the injections into the baking chamber of a quantity of "live, wet" steam, *not* superheated vapour. The required number of pound pressure of this steam is generated and stored up in a boiler, the boiler being connected to the baking chamber by a metal pipe. This pipe is connected with other perforated pipes inside the oven. When the discharge tap of the steam boiler is turned on, the perforated pipes receive the steam and distribute it over the whole area of the baking chamber. The dough for bread or rolls, being moist and placed in the oven in this steam, becomes wet, and the starch gelatinised; the extreme heat quickly gripping this gelatinised surface, it sets in a firm glazed crust.
>
> This glazing, though associated with "Vienna" bread, will affect all kinds of dough in the same way, if subjected to the same conditions in the baking.

Q. Is a specially constructed oven necessary to receive this steam for the purpose of baking "Vienna" bread?

A. No. Any kind of oven will do, but its crown or roof should be low, so that the injected steam may be brought in direct contact with the rolls or loaves.

Note.—There are specially constructed ovens for this purpose, with the bottom or sole inclining upwards from the door, the farther end being on a level with the top of door. This type of oven is constructed chiefly for the purpose of retaining as much of the injected steam as possible, and also serves the purpose of getting the rolls out of the oven quickly, The decline being towards the door of the oven, a start with a rod will set the rolls travelling downwards and out of the mouth, into a basket or other receptacle waiting to receive them. A much more useful as well as time-saving device would be a low-crowned drawplate. This drawplate being drawn out, could be emptied by two or three scoopfuls, if the scoops were made flat-bottomed, having on one side a left for the one and a right side the other.

If "Vienna" bread or other small rolls are made, there should be added to the list of apparatus mentioned a roll dough divider. A piece of dough of a certain weight is placed in the divider, the lid closed, and, simultaneously with the closing of the machine, the dough is divided into twenty or thirty pieces of equal weight, from two ounces to six ounces as desired.

A proving cupboard will also be necessary. This is a cupboard heated by steam. The rolls are placed upon boards or tins, and are then put into this warm, moist cupboard to aerate. This has the effect of keeping the surface of the rolls moist, and being in this moist state when put into the oven, the steam which has been ejected into the oven fastens upon the bread, and the heat of the oven quickly setting, this melting surface forms the glazed crisp crust so much liked by bread connoisseurs.

Pails, flannels, scrubbing-brushes, are not mentioned. These belong to the charwoman's department.

Q. The bakery being fitted with the necessary plant, state the number of persons that will be required in the bakery to make either of the before-mentioned quantities.

A. Given that the bakery is fitted with the necessary machinery and appliances for loaf bread-making, each man, whether the output is one hundred or one thousand bags (140 lbs. each) per week, should be required to manipulate twenty-four to thirty bags per week of the dough from the machine to the oven, and the baked bread from the oven to the carrying racks or boards.

Q. State the number of persons required for the distribution sale and clerical department.

A. 1.—For the distribution of the bread made from forty bags of flour, in large quantities (wholesale), a van drawn by horse or

motor, with two attendants (a man and a youth), and a book-keeper, who would also act as teller of quantities.

2.—If the distribution is in retail trade or small quantities, the number of calls will necessarily be increased, and the labour will therefore have to be doubled. Two vans should be each provided with a man and youth. In the case of a credit trade, a book-keeper and assistant for checking will be required.

3.—If the distribution is made by hand-cart, or by basket, the labour in each case will have to be doubled, but the clerical work will remain the same.

> *Note.*—These are but roughly adjusted details as to the labour required in distribution. Every case is, in fact, a law unto itself, and can only be fairly gauged when all the details are known.

Catering, Sugar Confections, and Flour Confectionery.

These branches of the trade are closely allied to that of the bread baker, and in a large number of businesses form a part of the baker's trade. It will therefore be useful to know what other appliances than those already mentioned are necessary in such cases, and whether separate rooms are required for each of these departments.

These points involve the separating of the business into two sections—one dealing with those where the work is done by manual labour, and the other wherein power-driven machinery and apparatus is employed as much as possible. The following questions and answers have been framed to meet this.

Q. Are separated premises or rooms required for catering for sugar confections and for flour confectionery?

A. A percentage of these composite businesses are carried on in the same chamber, and it is only in a very few instances that they are conducted concurrently during the same hours.

A still smaller percentage use the same ovens for all classes of baked goods, but have one or more rooms separated from the bakehouse for catering and confectionery work.

It is only in about 3 per cent. of this kind of business, where the annual turnover in each department is so very large, that separate buildings, staff and equipment are requisite.

When the total annual turnover from all sources does not exceed £2,000, the bakehouse will be sufficient, where the floor space affords room enough for all these departments. The work is usually divided between two sets of workmen. The bakers who commence work at midnight, or earlier, have, we will say, made all

the bread, and got it out of the way by 8 A.M. They will then perhaps finish up their day with the making of the ordinary plain kinds of flour confectionery, articles of the bun and scone tribe, etc. The confectioner or *chef* begins work at from 6 A.M., and uses the bakehouse the remainder of the time. This is an economic arrangement, as it fills up the whole twenty-four hours.

If the annual turnover runs into high figures, then, of course, the manner of working will have to be arranged to suit the particular case. Sometimes the output of a certain class of goods is so large that, although it is only a branch, yet it needs special facilities for dealing with it.

Q. What appliances and utensils will be required in a small business conducted by manual labour only?

A. The following utensils will be useful:—An egg whisk for sponge-cake goods, etc.; copper and tinned iron pans in which to beat cake mixtures; boilers and stock-pots; steamer and stew-pans; peeling, pulping, and freezing apparatus; sieves, strainers, dredgers, paste-cutters, rolling-pins, knives, meat-saw, chopper, and block; fish-kettle and frying-basket; wood and iron spoons. A marble, iron, or slate slab; tabling, shelving, and cupboards; bins on castors for the storage of small quantities of raw material to work from; a stove, range, and hot closet; a refrigerator, etc.

Q. How much work per man a week will be a fair estimate for this class of trade?

A. This will depend, of course, upon the kind of work the men are engaged in, and also the quantities made up of each kind or variety of goods. If the quantity of each sort is small, and the variety large, the retail value of the output should be about £15 per person. If, on the contrary, the varieties are few, and the bulk of each of these large, then the total retail value should be about £20. This estimates for hand labour; 15 per cent. per man should be added when there is power-driven machinery.

Q. What appliances and utensils will be reqired for a business in which power is employed?

A. An oven, or ovens, with travelling bottom, cake and egg-batter beaters, biscuit brakes, forcers, and cutters, almond machines (various), mincers, peel cutter, fruit cleaner, and if the trade is large enough, a fondant beating machine. The following apparatus will, in many cases, be necessary:—

Meat and vegetable presses, potato peeler and slicers chocolate machine, fondant moulds, steam-jacketed boilers, etc

Q. What is the most useful form of power to employ?

A. The supply of power to a factory is often governed by local and other circumstances. From a commercial or practical point of

view, there are four sources of power at this date which claim attention, and these are steam, gas, oil, and electricity. If we were speaking of *the* power of the future we should probably delete the first three, and proclaim electricity as the power, for its easy adaptation to the needs of these trades, its cleanliness, its simplicity in working, and its economy of space ; but for small plants the need at the time of writing is a conveniently handy public supply station, and until this is general in all towns and villages, and bearing in mind the requirements of the ordinary run of businesses, the choice must be between steam, gas, and oil. Steam for the class of business under discussion really comes third on the list, for the reason that the cost of supervision is heavy, and that expert attendance is necessary. It is also a dirt creator.

> *Note.*—It is always advisable when preparing plans for the erection or re-erection of premises, wherever machinery is to be employed, to call in the engineer for consultation with the architect or builder. It often happens, where this course is not followed, that when the engineer appears upon the scene the structure has been partially or quite erected. The consequence then is, that in many cases he will have to strengthen or cut away work that has just been finished, and hence cause needless additional expense. It is obvious that this would be quite unnecessary if he had been called in at the beginning.

GAS ENGINES AND MOTORS.

THE use and management of a gas engine or motor is a necessary part of the knowledge of a progressive baker or confectioner ; a few words anent thereto will therefore be required in the "Bakers' Guide." We will begin with the belting. The manager of an engine should understand the management of belts. What are belts? Belts are means whereby power is transmitted from one point to another. There are several kinds of belting. First, leather ; and some think there is nothing like leather. The sizes and thickness will depend upon the amount of power to be transmitted. Although power is carried by belting for considerable distances, it is thought by those who know that it is not profitable to carry it by belting for more than twenty-five feet. This fact should be kept in mind when erecting bread-making machinery. Sometimes ropes running in grooves are used instead of leather ; sometimes, when very heavy work is required, chain belting is used, running upon metal teeth—cogs.

Friction.—No matter how tight your belt is, there will be slipping. The belt and the pulleys will not run at the same

speed, and there will be friction; but, unless quite compelled, do not put rosin on the belts, it will wear them out faster. Nor should water be used, it has a corroding action upon metals, and also impoverishes the leather of the belting. The best way to reduce the friction caused by slipping of the belt is to reduce the strain of work, and when they stretch too much to take them up an inch or so tighter. Very tight belts in dough-making are dangerous, the resistance of the dough being unequal as it gets firmer, and perchance too much flour is put in, and it makes it very hard, or some solid substance falls in between the blades, then something would give way, and it is better that the belt should slip than break, or the shaft twist or engine pull up from its bed. There is a prepared and special lubricating jelly or paste, filled into caps, the caps being screwed down over a pin-hole: the revolution and warmth draw the lubricator down on to the shafts and pulleys, and parts where friction occur. The best oil only should be used; inferior oil will clog, it is useless for quick-running machinery. Boiled linseed oil is not the best to use, you seldom get it pure. Very good lubrication is made by mixing linseed oil and hogs' lard together. *Beware of friction*, give immediate attention to any noise, or any bearings that get hot. Friction is very destructive, therefore keep engine and machinery well oiled, and always clean. A little grit or dust getting into the more delicate bearings of the gas engine will create mischief, and will soon destroy its efficiency. For this reason the engine should always be enclosed in a separate room, or partitioned off. The slide valve, or the ignition tube, whichever is the type, should be taken out, carefully cleaned every week, or the explosion will be spoiled; but great care is necessary. The parts must be accurately adjusted again, or friction and bad work will result. The spindle of the tube must be worked into the proper place. If you have not been taught how to do this, send for a proper workman, and don't interfere with it yourself.

Mending or Joining Belts is usually by butting or lapping. To mend by butting, bring the two ends level together and lace with stout strips of leather. To lap is stronger than to butt, but there must be several inches more belting. The mode of lacing in either case is to punch a corresponding set of holes in each end. Three sets of two holes. Lace transversely, and securely fasten the ends upon the *outside* of belt. There is a simple and very convenient metal fastener now used in the place of lacing. The ends of belt are brought together, and the fastener overlaps both ends, and is driven into the leather; but the tendency is to break away the ends of belt, and then it will require lacing. These metal fasteners are suitable for light work—cake machines,

etc.; but two or three sack dough mixers should have laced belts.

The Gas Engine is worked by the energy derived from an explosion of a mixture of air and gas, taken in as follows: There is a cylinder in which are four holes; one for letting the gas in, one for letting the air in, one for letting the results of the combustion out, and one to let a flame of light into a small chamber so as to touch the mixture of air and gas, and explode them by lighting the gas that has come in. These holes are covered or uncovered by a slide which moves backwards and forwards, worked by an eccentric, as in the case of a steam engine, with this difference: the slide moves to and fro once while the crank shaft makes two revolutions. In other words, the slide makes two strokes while the piston makes four. When you turn the wheel the piston moves forward, and a charge of air and gas is drawn in; the piston moves back, compressing the mixture of air and gas, and then the charge is fired by the light at port-hole, and the piston is driven forward; by the revolution of the crank the piston returns and expels the waste products of combustion into the exhaust box. The energy derived is at the third or working stroke. During the other three strokes means are found to carry on the work of the engine by stored-up energy not used in the first and second strokes. The fly-wheel is a conservator of energy, has usually a very heavy rim, and is large and heavy in comparison to the other parts. Most know that it is easier to catch and stop a light indiarubber air ball than a solid leather cricket ball, for the reason that *the energy in a moving body is proportional to its weight.* During the third stroke a large amount of energy is given to this fly-wheel, and the rapidly revolving fly-wheel gives this energy out again during the next three strokes, and so on.

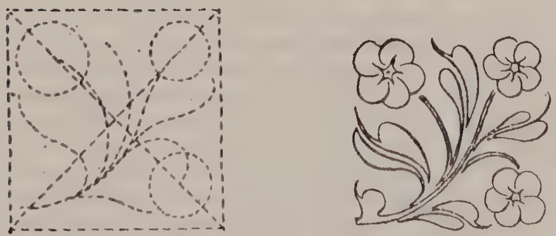
The use of the governors is to regulate the amount of gas going in, upon the principle that a heavy ball swinging in a circle round your head by means of a string, the faster you swing the ball round the surer will the ball rise to the horizontal plane of your hand. If the engine is going very fast the two balls of the governor fly farther apart from each other, and in doing so work a lever which shuts off some of the supply of gas; and then, when they drop down by the speed being reduced, the lever opens again and the gas supply is increased.

H.P. plan:—P. equals pressure per square inch of cylinder; L., the length of stroke; A., the area of cylinder; N., the number of working strokes per minute.

The Exhaust.—The exhaust pipe should be kept clear of wood or other inflammable matter, as it gets very hot when in continuous use. The pipe should not have many, or too acute,

angles; angles interfere with its good work. The circulating pipe should slope up the whole way. The water tank should have a ball tap, and at a proper level a waste-pipe should be fitted to tank, so that, when in continuous use, and the water gets foul and hot, the water can dribble out of waste, and dribble in from ball tap. A gas engine gets very hot during continuous use, and a constant circulation of cold water round the cylinder is absolutely necessary, to prevent destruction or damage by the heat.

To Slacken Speed.—When only a little power is required, take off cap from governors, and turn off gas slightly. Don't waste gas, either by running and doing no work, or by leaving port-hole alight when engine is stopped. When you buy a gas engine, buy one larger than you want. It is an unpleasant experience to have an engine slowing up and stopping when it receives too much work for its size. An increase of trade will mean, otherwise, the buying of a larger engine.



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CATERING.

The provision, preparation, and purveying of food-stuffs is undoubtedly one of the most important, intricate, and specialised of all the trades which the requirements of modern life have given rise to. It is certain, too, that in no other is more expert skill and knowledge necessary for the proper manipulation of the raw materials with which it is concerned; and in none is the need for prompt disposal, experience, management, and exact organisation so indispensable. With products so transient and perishable as those used in the caterer's business, anxiety and uncertainty attends every stage, from the original procuring of the flesh, fish, fowl, or vegetables, right through to the ultimate table to which it is conveyed—cooked, garnished, and appetising.

In the face of these facts, it is curious that among the British public, into whose social life the public and private dinner and other festivities enter so largely, so much ignorance and thoughtlessness in regard to the conditions and limitation of catering should be displayed. If this were not the case, we should hear less often of the hostess who, when considering a catering estimate, remarks that the meat, poultry, or vegetables would only cost so much, implying that the prices quoted are excessive. Such people always forget that the caterer, before his own profit comes into the reckoning at all, has to provide for the excessive waste and depreciation to which his raw and manufactured goods are liable, establishment management charges, and large items of expenditure in labour, wear and tear and up-keep of the plant, linen and fittings breakages, cleansing, etc. The attitude of the "diner-out," who complains at public banquets the viands, etc., are "not worth the money," is identical. He also persists in overlooking the very heavy expenses we refer to.

These factors in the cost of service and equipment are therefore very serious matters for the caterer, particularly when it is remembered that in many cases they will amount to as much—in some cases more—than the cost of the provisions.

Catering may be divided into two broad divisions, *i.e.*, catering on the premises, and catering at the premises of clients. These two kinds of contracts may each be separated into two sub-divisions, denominated "Catering for the Classes" and "Catering for the Masses."

In considering the first two divisions, it is important to note the difference of expense involved by the circumstances under which the catering is carried out. Where these compel the

transference of cooking and service staff from his own to the establishment or place where the service is to be made, it will be obvious that the expenses of the contractor will be much heavier than if such service took place at his own premises. In the former instance, such items as conveyance of staff, provisions, cutlery, plate, crockery, table decorations, linen and kitchen utensils must be allowed for.

Another point to be remembered is that in providing for a large party, opportunity should be taken to increase the variety of the meats and sweets. It will make no difference to the caterer if a guest has one cut from separate entrées or two from the same one. The added cost, if any, is trifling, and will be amply repaid in the satisfaction of the patron and his guests, and the increased popularity of the caterer.

It is not so much the quantity of the food provided and consumed that matters as the character or class of service.

Q. Can prices of typical menus, inclusive of fitting and service, be given?

A. No. Every breakfast, lunch, banquet, soiree, supper, or festival should be considered on its merits, and be the subject of a special contract or arrangement between the caterer and the customer. It is unwise even to approximate. This statement will be borne out by all experienced contractors, and will be accepted after a perusal of the preceding introduction to this section, and a careful consideration of the varying conditions under which orders for catering may have to be executed. The following may be mentioned as important after the question of place:—First in order comes style of service and number of waiters, appointments of the table and chamber, or it may be that the quality and character of the viands and other refreshment will have to have more consideration. A second point for inquiry will be as to whether the estimate is to be "per head," or for the party, the number, class and kind of guests—if adults, young people, ladies and gentlemen, or a mixed company—so as to form an idea of the probable consumption of food. The third question will be: Is the contract to be "at your own risk," with tents and attendants provided by the caterer? It is necessary to know, also, how long the entertainment will last, and if guests can go out for refreshment elsewhere and be permitted to return.

The fourth consideration is whether the entertainment is to be a public dance or soiree, the caterer having to fit up buffet seats, etc.

In contracts taking all risk at so much per head, too much care cannot be taken to remember that the price should depend upon the probable number of guests, their age, sex, and class.

Young people dance more than the old, and becoming very hot, pay frequent visits to the buffet.

Q. Describe a menu suitable for both medium and high-class banquets?

A. A selection may be made from the following Bills of Fare or Menus for the purposes of the average banquet, dinner, supper, soiree, dance, or garden party :—

FOR TRADES, SOCIETIES.—MEDIUM CLASS.

I.

Hors d'Œuvres.
Ox Tail.   Tomato.
Filleted Sole.   Hollandaise.
Whitebait.
Sweetbread Cutlets.   Sauce Piquante.
Spinach au Jus.
Roast Beef.   Horse-radish Sauce.
Boiled Mutton.   Caper Sauce.
Vegetables in Season.
Tart.   Custard.   Genoese Glacé Assortis.
Ice Pudding.
Stilton.   Cheddar.   Celery.
Dessert.

II.

Potage aux Croîtons.   À la Tortue.
Suprême Sole Fernette.
Smelts.
Contre Filet Braisé.
Rissolées.
Calf's Head à la Poulette.
Roast Turkey.   Baked York Ham.
Spinach (or Vegetables in Season).
Apricots à la Conde.   Meringues.   Chantilly
Jelly.   Ices.
Gorgonzola.   Cheddar.   Celery.
Dessert.

III.

Hors d'Œuvres.
Olives.   Sardines, etc.
Pot au Feu.   Sorrel Cream.
Turbot.   Shrimp Sauce.

Plaice. Fillet. Tartare Sauce.
Patties. Oyster or Lobster.
Fricasse Chicken. Roast Fowl. Espagnole.
Roast Beef. Boiled Mutton.
Mashed Turnips. Mint Sauce.
Vegetables in Season.
Triple. Meringues à la Vanille.
Tarts. Ice Pudding.
Cheese.
Dessert.

IV.

Julienne. Mock Turtle.
Turbot. Lobster Sauce.
Fried Fillets. Sole. Tartare or Whitebait.
Lamb Cutlets. Boiled Chicken. Celery Sauce.
Asparagus.
Roast Mutton. Red Currant Jelly.
Roast Chicken. Ham.
Vegetables in Season.
Tipsy Cake. Dantzic Jelly.
Genoese Glacé. Ices.
Cheese. Celery.
Dessert.

FOR HIGH-CLASS SERVICE.

For a Sporting Press Banquet.

Melons de Cantaloup Rafraîchis.
Hors d'Œuvre Variés.
Potage Pink 'Un.
Filets de Sole à l'Indienne.
Suprême de Volaille à la Lucullus.
Quartier d'Agneau à la Boche, Sauce Menthe
Petits Pois, Pommes Mont d'Or Gratinées.
Punch à la Romano.
Jambon de York Braisé au Champagne.
Cailles en Crapaudine, Sauce Diable.
Salade de Saison.
Pêches Glacées à la Parisienne.
Bombe Pralinée.
Diablotin à la Vaudeville.
Dessert.
Café.

For a "Smart" Supper or Lunch.

Oysters, Plain, Roasted, etc.
Broiled Black Bass. Fried Perch.
Broiled White Fish.
Sliced Tomatoes. Sliced Cucumbers.
Queen Olives. Radishes.
St. Dennis Potatoes.
Hashed Brown Potatoes.
Chicken Salad. Shrimp Salad.
Cold Boiled Chicken. Cold Roast Beef.
Roman Punch.
Rolls.
White Bread. Brown Bread.
Lemon Jelly. Wine Jelly.
Peach Sherbet.
Ice Cream. Assorted Cake.
Apples. Pears. Peaches. Bananas.
Tea. Coffee. Iced Tea.

For an Official Banquet of one of the Learned or Aristocratic Societies.

Hors d'Œuvres.
Salade d'Anchois. Caviar.
Consummé Printanier Royale. Crême à la Reine.
Filets de Sole à la Richelieu.
Blanchailles au Citron.
Ris de Veau à la Financière.
Aspic de Foie Gras en Belle Vue.
Aloyau de Bœuf, Raifort.
Selle de Mouton. Gelée de Groseilles.
Petit Pois à l'Anglaise. Chouxfleurs.
Pommes Nature.
Poulets. Caneton à la Broche.
Salade à la Française.
Bavarois aux Pêches. Gateau à la Chantilly.
Gelée à la Moscovite.
Glacé aux Framboises.
Dessert.
Café Noir.

For a Banquet given by a Prince.

Bisque d'Ecrevisses et Exly Frais à la Russe.
HORS D'ŒUVRES.
Melon Glacé. Beurre. Crevettes de Dieppe.
Hareng Frais de Hollande.

RELEVÉ.

Soles à la Marèchale.

ENTRÉES.

Noirettes d'Agneau avec Crême d'Argenteull.
Foies Gras à la Rossini.
Quenelles d'Esturgeon à la Joinville.
Sorbets au Porto Blanc.
Granitè Grande Fine Champagne.

RÔTS.

Canetons de Rouen Flanqués d'Ortolans en Brochettes.
Chaufroix de Paons en Belle Vue.

LEGUMES.

Flageolets Nouveaux au Beurre.
Pois à la Française.
Ecrevisses de la Meuse au Vin de Saumur.

ENTREMETS.

Bombe Galitzine.
Poires Cressonnes.

DESSERT.

Banquet for a few Society Gentlemen.

Hors d'Œuvres.
Olives. Oysters (various preparation.
Salted Almonds.
Green Turtle.
Penobscot Salmon. Hollandaise.
Sweetbreads, Vol au Vent.
Filet Mignon Beef, perigord.
Asparagus Points. Potatoes au Surprise.
Punch à la (Host ou Contrée).
Roast or Cold. (To suit company and temperature.)
Neselrode (Ice) Pudding, and Coffee Ice, served in small moulds.
Meringues (Chantilly) petit fours Assortis.
Stilton. Chamambere. Cheddar.
Café au Lait. Brandy. Liqueurs.
Dessert.
Music.

FOR A CHRISTMAS DINNER.

Two Soups (a Clear, a Thick).
Two kinds of Fish (a Boiled and Fried), with attendant sauces.
Boiled Fowl and Ham.
Rissoles.

Roast Beef and Horse-radish Sauce or Roast Turkey and Sausages.
(If many guests, put on both Turkey and Beef.)
Sprouts. Cauliflower, or a vegetable in season.
Potatoes, baked and boiled.
Plum Pudding. Mince Pie. Pastry Assorted.
Tipsy Cake. Trifle. Meringues and cream.
Cheese and Celery.
Snapdragon.
Dessert.

FOR A DANCE, CONVERSAZIONE, OR SOIREE.

In this case a buffet will have to be provided, with an assortment of savoury and sweet snacks, and various liquid refreshments. The host usually supplies the wines and liqueurs, and sometimes prefers to make the claret and champagne cup.

The number of guests and the price paid must guide the caterer in his choice, and determine the variety of quality of the items supplied, as well as the character of the service and appointments.

Note.—For wedding and other similar receptions, it will be necessary to add to this list a variety of prepared meat stuffs, such as dressed ham, dressed tongue, and cold roast fowl. For some occasions the fowl may be cut into small neat portions, each tied up in a bow of white silk or satin ribbon. Galantines (various), cold roast beef, mayonnaises (various), prawns in aspic, blanc-manges, jellies, etc., etc., may also be included. Sandwiches may be provided of ham and tongue, ham and beef, salmon, lobster, and other pasties, etc. In hot weather, watercress, lettuce, salads, etc., may find a place. Other items may be found among patties, lobster, oyster, foie gras. Shrimp gateaux (various), petits fours glacé (various), English and French pastries. Rich cakes, with and without fruit, crystallised fruits, chocolate, etc. Ices (various), including vanilla, coffee, strawberry, raspberry, ice souffles, etc, Tea, coffee, plain lemonade from lemons, aerated waters, Carlsbad waters, claret and champagne cup.

Q. What particulars should a caterer require before undertaking a contract to supply refreshments, or before giving estimates and prices for banquets, etc., etc.

A. The place where the service is to be made. The class of guests, and the minimum number expected. The requirements in the way of services of the host or committee. Will his name as caterer be known, and therefore his business reputation involved?

Note.—These particulars are necessary to ascertain the cost of cartage and porterage, and approximate increase in breakages, etc. The style and class of fittings—plated, gold, or silver—and the number and quality of waiters, and

whether the name of the caterer being known to host and guests, a better service than the contract really warrants is advisable for the purpose of advertisement and increased reputation.

The kind or class of goods, as has been said before, is quite a secondary consideration, except in cases where the guests are epicures. Even in these exceptional cases there need be no great anxiety. Contracts of this character will always permit of all that is necessary by way of material or *chefs* being procured, and the differences between the costs of beef and mutton, turkey, goose, duck, or fowl, cod, brill, turbot, or salmon, do not amount to enough per portion to be worth mentioning. Any special items required can always be provided for.

The difference per head in the cost of providing a variety of vegetables is also inconsiderable, and should not cause the caterer to lose an order.

PRACTICAL HINTS FOR WEDDING BREAFASTS.

The first thing to be observed, after determining the number of invited guests, is to see that there will be comfortable sitting room for all, for a crowded guest-chamber is a pregnant source of annoyance and discomfort, and particularly so to ladies, who have a great and not unnatural horror of having their dresses creased or crushed. I never allow less than 18 inches sitting room for each person, and prefer to allot 20 inches, particularly when cane-seating is furnished. Of course, when chairs are provided, the question is readily solved. It need scarcely be mentioned that the table must be of proportionate length, and for a room of limited dimensions I would suggest a table of not more than 3 feet wide, should this with other furniture have to be hired.

Thus, for forty guests, a room would be required at least 22 feet wide by 24 feet in length. In this space the best shaped table would be one of "horse-shoe" form. This would give 15 feet outside measurement, and 12 feet inside. Such a table would give comfortable sitting room for forty—nine persons (20 inches each) being ranged on the outsides, and seven persons on each of the inner sides; while six persons would occupy the cross-table, and one person each of the two ends.

Following out this idea of a "horse-shoe" shaped table, I would hint that the tablecloth on the cross-table is better spread before the long table is brought close, as this gives a neater appearance, and avoids the ugly bulge at the inside corners.

Each guest must have two plates, two knives, two forks, two dessert spoons, three wine glasses, a napkin, and finger-glass; and it is usual to put one tumbler to every other person.

The table being ready, I now proceed to submit a few suggestions with regard to the dishes usually served throughout the year according to the season.

And first I would remark that of late years it has become the fashion to serve one or two light seasonable soups, such as asparagus, brunoise, carrot, green pea, julienne, ox-tail, Palestine, spring, clear turtle, white soup, etc. Plain roast chickens and ducks are always standard dishes, the former being cut on the under side, and tied with white satin ribbon, finished with a bow or rosette, and garnished simply with parsley and vegetable flowers; it is also usual to put small paper frills on the legs. Other dishes in order would be the galantines—for example, those of turkey, fowls *à la tortue*, lamb or Muscovy duck, veal; various kinds of game, ornamented with its own plumage, or otherwise, like the other galantines, with aspic jelly in the three colours—amber, ruby, and green. Designs formed with truffles cut in different shapes, and placed on some of the galantines, have also a very pretty effect. Then follow tongues and hams modelled, or decorated with aspic jelly; aspic fillet of sole, lobster, eel, pigeon, quail, etc.; game, chicken, pigeon, and other pies; Montpelier eel, mayonnaise of salmon and lobster, bechamel and mayonnaise fowls, pigeons as doves, patties various, prawns and plovers' eggs mounted, fancy, French and Italian pastry, ornamented savoy cakes, gâteaux various, tourtes with ornamental covers, jellies and creams, trifle, tipsy cake, fruits various fresh and preserved, and water and cream ices.

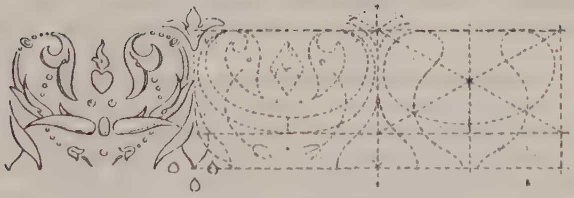
The bride-cake, which is always the principal object of attraction at such functions, should be as ornate as possible, and placed on a stand in the centre of the cross-table. Wedding or bridal bonbons, in white and silver, should be freely distributed over all the table.

In further ornamenting the table, I would suggest a liberal use of flowers, and a very pretty effect is produced by placing a buttonhole bouquet in a small fancy glass before each guest. The bride and bridesmaids' bouquets might also be placed at intervals down the centre of the tables.

For forty guests, three or four waiters or attendants would be required. If tea or coffee is provided, it must be served directly the guests sit down; but it is now more usual to serve coffee just before the bridal party breaks up. If soup is on the menu, it must be served (directly the guests are comfortably seated), by the waiters from the sideboard. A small menu card, with the name of the guest written on it, should be placed on each plate,

and it is very desirable that a lady and gentleman should be seated alternately at the table, so that the dish that is opposite, or nearly so, may be served by the gentleman. The champagne should be well iced, and the other wines should only be decanted just before the guests sit down.

For effect, it is rather important, in putting the various dishes on the table, that each sort should be as far apart as possible. Thus, if there be a galantine of turkey, it should be put at one end of the long tables, then another galantine on the cross-table at the other side; and if there are more galantines or game or meat pies, they should be placed near the centre of the long tables, with a ham or tongue in close proximity. The chicken and ducks should be placed single, and not near each other. Aspic jellies and salads alternately, creams, jellies, and fancy pastry distributed generally over the tables; the gâteaux and other cakes put on some of the centre high dishes, as also the fruit. The ices are served round.



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FLOUR.

Q. What is flour?

A. Finely ground corn from which most of the outer husk and branny fibre has been separated after grinding, by "bolting," by air currents, or "dressing."

Q. Is there more than one kind of flour?

A. Yes. Wheat flour, maize flour, rice flour, rye flour, etc. There are also the flours of the pharmacopœia, flour of sulphur, etc., but owing to the remarkable cheapening of wheat during the latter part of the last century, the word flour, as applied to flour from corn, has lost its generic meaning, and now when flour, without a prefix, is spoken of, it always means flour from wheat.

Q. If all corn were ground to an equal fineness, and refined, would the flour from any of the varieties above mentioned be equally good for bread-making?

A. No. The flour from wheat is without compeer as a bread-maker. Wheat contains one constituent—gluten—not found in the same form in any other cereal. This gluten becomes a tough, elastic substance when moistened, but is insoluble in water. In the process of bread-making it entangles the gas generated by the yeast in its effort to escape, and as a consequence the dough is distended, vesiculated, and "light."

The gluten of wheat is also a valuable foodstuff; it belongs to the class known as proteids, the flesh, muscle and tissue formers. It is a nitrogenous body.

Q. Do other cereals contain nitrogenous substances?

A. Yes, but in a different form to the gluten of wheat. Oats, barley, and rye contain as much as, or more, than wheat, when estimated in the grain of these albuminoids, proteid (nitrogenous) matters, and therefore, as food-stuffs, they rank, in the grain, as high. When, however, they are ground and refined into fine flour, they lose a large proportion of it, and what is left does not cohere and form a substance which can be abstracted by physical means, but it breaks up or separates into individual atoms when moistened. The moistened mass, unlike that of wheat flour, is not tough, elastic, and tenacious, but short and friable, allowing the aerating gas to break through and escape easily, leaving it in a close, sodden condition.

Another feature of the rye and barley, especially when ground and made into bread, is that it leaves a strong and coarse flavour upon the palate.

Q. Is there much difference in the chemical composition of these cereals?

A. They have nearly the same chemical composition, but the quantities in each of starch, cellulose, moisture, fat, sugar, albuminoid, and proteid matter vary considerably. Different samples of the same cereal also vary in the proportion of these constituents. The chemical value of an average sample of wheat flour is:

Carbo-hydrates (Starch, Cellolose, Sugar), ...	74·0
Albuminoids (Gluten, Albumen, Legumin, Cereulin),	13·3
Mineral Matter and Fat, ...	1·2
Moisture, ...	11·5
	100·0

The approximate quantities are 65 per cent. to 68 per cent. of starch, 13 per cent. of albuminoid and proteid (gluten, etc.), 11 per cent. of water.

Q. Explain the meaning of the terms carbo-hydrate and albuminoid.

A. Substances composed of carbon, hydrogen, and oxygen, the hydrogen and oxygen being found in them in the same proportions as in water (H_2O), are named carbo-hydrates, the formula being $C^6H^{10}O^5$ for cellulose and starch, $C^{12}H^{22}O^{11}$ and $C^6H^{12}O^6$ for sugar.

The albuminoids are the nitrogenous gelatinous matters, nutrients, etc., containing nitrogen (CHNO and CHNSO).

Q. Is there any difference in the food-value of the starches of different cereals?

A. All starches have the same molecular formation, $C^6H^{10}O^5$, and have the same value as foodstuffs. When in a state of equal refinement they are also very similar in taste. Being minus N, starch cannot form muscle or tissue. Its chief use in the animal economy is as a filler and heat producer, and it is therefore a very useful and valuable food.

When examined with the aid of the microscope, the granules of the various starches are seen to have a different shape. Those of the wheat and rye are round, or nearly so; that of the barley is also round, but with an angular tendency. The starch granules of the potato suggest the shells of oysters and mussels, and are endowed with similar rings. The arrowroot granule is oval, and resembles an egg in shape, while those found in rice are polygonal, possessing three, five, or six sides, or angles, and maize hexagon, with nearly round angles. The starches of potato and arrowroot can be easily picked out from a mixture of the starches of these cereals, but considerable microscopic skill is required to separate the starches of wheat and rye, and those of barley and oats, or those of rice from maize.

Q. Describe a mode of separating the starch, gluten, and

soluble matter in wheaten flour, without aid from chemical apparatus or a knowledge of chemistry.

A. To separate the starch of gluten in this way, put a handful of flour into a basin, and make it into an ordinary well-mixed dough with water. Cover up from the air, and leave for two or three hours to enable the atoms of gluten to cohere with one another. Then enclose the mass in fine "bolting silk" or tough muslin, and having turned on a dribble of water from the cold water tap, place a large basin under it, and work the dough with the hands under the water as it falls. The starch and soluble matter will run through the muslin, the gluten remaining in it, soft, sticky, and insoluble. Let the water in the basin remain until clear; the starch will then have settled to the bottom. The water, which will contain the soluble matters, sugar, albumen, etc., can then be poured off.

Q. Give a simple method by which the quantity and character of the gluten in a parcel of flour can be ascertained.

A. To ascertain the quantity, weigh upon a finely adjusted balance 20 grams of the flour, put into a basin, and, with water, make it into an ordinary well-mixed dough, using for the purpose the handle of a metal spoon, glass rod, or similar instrument having smooth surface, to prevent the smallest particle of the dough from adhering. Cover up and leave for two hours, to allow the gluten to cohere. Then enclose every scrap of the dough in a piece of miller's "bolting" material, and wash under a dribble of water until the starch is all washed out of it (until the water passes through without the faintest tinge of milkiness). Then open the enclosure, and, with the water still running into the gluten to prevent it sticking, collect all the gluten. Squeeze as dry as it will allow without sticking to fingers, and weigh it accurately. Twenty being the fifth part of a hundred, multiply the weight of the gluten by five, and the percentage of wet gluten in a hundred parts is the result.

Some glutens part with water less completely than others, and therefore to be quite accurate it is preferable to weigh the gluten in a dry state. For this purpose take two pieces of paper of exactly the same weight (balance one against the other on the balance), place the wet gluten upon one piece, and put it in a warm chamber or oven (which should not be hot enough to cook but only to dry) until thoroughly dry. It can then be weighed, care being taken to place the duplicate piece of paper on the weights side of the scale. Multiply the weight of it by five, as before, and the percentage of dry gluten in a hundred parts of the flour will be the result.

To ascertain the character of a gluten, wash the dough uncovered in the hand, using the senses of sight, touch, taste,

smell. In determining this test experience, memory and mental aptitude are important guides.

Hard, stable glutens hold tenaciously to the starch, while soft, weak glutens separate from it freely. When free from starch, and still wet, feel it. Some glutens are flabby when touched, and others short and friable; some are elastic and tough. Look at it, for some glutens are dull and opaque in appearance, some bright, shiny, and nearly transparent, some a silvery yellow, some a dull, bluish grey, with many varying degrees between these two extremes. Taste and smell for taint or rankness. While wet, form the gluten into a ball, place it in a greased tin, cover with a larger one, and put into an oven heated between 300° F. and 400° F., and bake for about 8 to 10 minutes. When taken out, note the amount of expansion, and also the appearance. Some glutens in a crude state expand more under the influence of heat than others. Others when baked look bright, with a light silvery sheen; others look dull and dark upon the surface.

The bright, light-coloured glutens are the first quality bread-makers, the hard and not very elastic will require more degradation, softening, and mellowing during fermentation than the soft, bright, and light-coloured.

The term gluten becomes more and more narrowed in its meaning to the baker as the years go by. Yesterday all the glutinous substances in cereals were classed as gluten; to-day the word gluten covers only that part which can be separated by washing the flour in water, is insoluble, and when obtained is elastic and tenacious. There are small quantities of glutinous substances obtained from rice, maize, and other cereals besides wheat; but they are not elastic, will not stretch out, will not retain the gas generated during fermentation, and hence they have ceased to be classed as gluten.

Crude gluten while wet is a soft, sticky-looking mass, and consists of the insoluble albuminoids of the wheat; it contains three albuminoids—glutenin, gliadin, and fibrin. To the baker, although gluten may be by the chemists split up into several bodies, they have such a close relationship that it will be probably only necessary for him to call and know them all as gluten; at any rate, this study can wait until to-morrow without loss to the workman.

Gluten is insoluble in water. When gluten has been dried and wetted again it loses its expansive power or principle. When dry it resembles glue, lighter in colour, but hard and shining.

Gluten when wet and left in contact with water is subject to the ordinary fate of moist nitrogenous substances. It decays and decomposes, and in that state, and exposed to atmospheric influences, it emits the usual unpleasant smell accompanying

decay. Its elasticity is also broken down, and it will be found to be in a state of chemical transition, having new properties which will displace (according to the time it remains in the wet state) the power of expansion and gas-holding capacity for bread-making purposes; but this chemical change also takes place in some degree during fermentation. This change is necessary in bread-making, we call it mellowing or ripening, and when so changed adds moisture and palatableness to the bread. It is owing to the excess and stability of gluten in wheat over the other cereals which makes the flour of wheat better for bread-making purposes than that of rice, barley, maize, etc. The presence in flour of a greater or lesser quantity of gluten does not prove its bread-making worth to the baker. The quality of the gluten, on the other hand, does.

Q. What is the shortest, simplest, and best way to test the bread-making qualities of several samples of flour?

A. To make them into bread. For this, weigh accurately the same quantity of flour from each parcel. Add to each equal weights of salt and yeast, and make into a dough of the same consistency by adding water at 100° F. Let all the doughs aerate under the identical conditions. After two hours, carefully note any changes in appearance, how much it rises, or whether the surface of any piece is cracking. Pick off a portion between the thumb and finger, and note whether it breaks off short and easily, or is tough and resisting. (Cracking and shortness are physical signs that the gluten is breaking, or broken down, and that the dough is ready for shaping and baking.) Leave the dough to aerate until there are at least incipient signs of this cracking, and then shape into loaves. Place them into tins of exactly the same size and shape. Let them aerate in the tins until they have risen to fully double the size they were when moulded, and then bake in the same oven at the same time. When baked note the difference in volume, colour of crust, and general appearance. When cold cut them across, and evenly through the middle, and note colour of crumb. Smell and taste will assist at this stage.

Redness of crust is a sign of the presence of soluble, unconsumed matter, or of minute particles of branny and other offal impurities. Whiteness shows excess of starch, and ultra refinement in milling.

With reference to the length of time required for the several processes mentioned, flours, containing glutens of different degrees in the stability and hardness, will require more time to mature in the dough stage, more during which to aerate in the tin; and those with more gluten of any kind, if equally matured, more time in the oven to bake.

A convenient weight of each ingredient for test loaves will be

—$1\frac{1}{2}$ lbs. flour, 7 grams salt, 14 grams of yeast. The amount of water cannot be given, because flours differ in the quantities of it they will absorb. A proper sense of touch must be cultivated to ensure an equal consistency for all the samples. If gram weights and balances are not available, use $\frac{1}{4}$ oz. salt, and $\frac{1}{2}$ oz. yeast, but balance each portion of yeast prepared for each sample of flour against every other portion on the finest balances obtainable. The yeast is a potent factor in this test, and a difference or variation in the quantities used will upset the accuracy of the test.

Q. How is the water-absorbing capacity of flours to be ascertained with exactitude?

A. This question has been attacked theoretically, practically, and commercially for several years, but, up to the time of writing, without resulting in any system receiving general acceptance, either in respect of scientific accuracy or commercial utility. Apparatus is as yet not theoretically perfect, and in practice has still to prove its commercial value even where it is found possible to secure the equal consistency of doughs with certainty. But though not absolutely successful, theory and practice between them have evolved sufficient knowledge of the subject to meet the ordinary needs of commerce.

It may, however, be stated broadly that the majority of average flours will absorb half their weight of water; $\frac{1}{2}$ lb. of water will make a pound of flour into ordinary baker's dough.

The following method of ascertaining water absorption may be recommended:

> Weigh an equal quantity of each sample, say 20 grams of each. Put them into separate basins, and with a cc. pipette, add water drop by drop, working each into a dough of as similar a consistency as the utmost care and judgment will permit.
>
> When all are made up, weigh each piece on a chemical balance, and make a note of the weights. The difference between the weights of each piece of dough, and that of the flour before the water was added (20 grams), will necessarily be that of the water absorbed.
>
> Multiply the water weight in each case by five, and the result is the percentage of water each flour will take in a hundred parts. The difference, if any, is seen at a glance.

Q. When a flour absorbs an excess of water, does it increase the money gain to the baker using it?

A. Given two flours of absolutely equal value in other respects, if one of them requires more water than the other to wet up equal weights of it into an equal degree of stiffness, *and if* (mark this proviso) it *retains* all this extra water during fermentation

and baking, and does not allow it to evaporate it as surely as it is absorbed, then such a flour is a money gain to the baker, the water being weighed as bread.

The answer to the following question will further elucidate this matter.

Q. Does an excess in the water-absorbing or retaining capacity of a flour entail a money or other loss to the public buyer and consumer of bread?

A. There is not the slightest loss in any way. The loss or gain in this respect only affects either the miller or baker.

> *Note.*—The two main water-absorbing constituents of flour are starch and gluten. Starch is highly hygroscopic in its nature, and flour is mostly composed of starch. Two parcels of flour from the same grist, if stored for a month or two *before being received by the baker*, one in a damp and the other in a warm, dry place, will each be found to contain a different quantity of moisture. The dry parcel will benefit the baker, as it will require more water to make it into dough than that which is more moist.
>
> The influence of starch in the direction of adding to the weight of a loaf by the moisture it may carry is very ephemeral, owing to the readiness with which the latter is thrown off by it. The starch in a loaf will not retain moisture long enough to appreciably affect the weight of the scales, unless during the baking it is gelatinized.
>
> Gluten, which is the bread-making foodstuff *par excellence*, is the other main factor in the water-absorbing qualities of flour, and also the chief water-retaining agent during the process of baking. Given two samples of flour, each containing the same quantity of the same kind of gluten, the drier sample will require more water in the process of dough-making, and the baker, in consequence of being able to add more water than if he were dealing with the more moist sample, adds to the weight of his baked loaf; but this notwithstanding, the interest of the public can in no way be injured, because the gluten in the flour will not, and cannot, be made to carry more water than is necessary to make it into a palatable loaf. If any excess of water has been used, that excess will be thrown off from the loaf during the baking period.
>
> A baked loaf from any flour, if properly cooked, cannot carry more moisture than is necessary to produce wholesome bread.
>
> It may be mentioned here, in respect to this question of the increased weight of baked bread by the addition of water, that all standard flours on the market have a known

intrinsic value, which is governed by their gluten percentage, colour, refinement, purity, and water-retaining capacity.

The baker profits from the general all-round excellence of his bread, and any statement alleging that he can benefit by an excess of water in the dough is quite baseless. The public can only be victimised in this direction when the baker supplies bread which is undercooked, sodden, and doughy, a course which it is obvious can only be to his own disadvantage.

Q. What are the causes in the difference of the tint or colour of flours?

A. Primarily, the variations in the relative quantities of the chief constituents of wheat (starch, gluten, bran, and fat), each of which may be said to possess a characteristic tint or colour.

A grain of corn may be said to consist of the body—the flouring part, known to botanists as the endosperm, enclosed in an envelope of skin—the bran of commerce. The body is chiefly composed of starch and gluten, the former in its refined state being white, and the latter alternating between light yellow and orange, and a bluish grey. The envelope or bran is reddish to pale brown. The colour influence of the relatively small quantity of fat, the remaining constituent left in the flour, is yellow.

Note.—A subsidary cause is found in the state of cleanliness of wheat before being ground (milled). Some are dirtier than others, and the cleansing process being imperfect, the colour of the flours they produce deteriorates in the direction of a faint grey tinge, in proportion to the amount of foreign matter which, thus allowed to remain, is to be traced to the admixture, during or prior to the milling, of dirty wheat, dusty sweepings from hoppers, spouts, bins, etc.

Q. Describe a simple way of testing for the tint or colour of flours.

A. Press a little flour quite firmly and smoothly upon a flat piece of wood or glass, and immerse in clean water until the surface of the flour is wetted, then put away until quite dry. The wetted and dried flour will reveal the colour. The different samples may be compared. Small match-boxes filled with flour and pressed down are very much more convenient for this purpose.

This is "pekarising" (after peker), and is a fairly accurate index, not only to the colour the goods will be when baked, or boiled, but in the hands of a careful observer will reveal more than a mere colour comparison. A light, bright creamy yellow indicates a high-class, well-refined flour; a light brownish yellow

shows strength and good quality. A flour that is of a greyish or reddish colour is of a poor and doubtful quality.

A simple and useful test, though old-fashioned:—Take 2 oz. of each sample, wet them into a like consistency with water. Tie each dough up separately in a piece of washed calico and put them into boiling water, and boil for 30 minutes. Take out of pot and turn out of cloth, and allow to cool, and then compare, examine. Note the colours, brightness or dulness, and the differences in size and the ridges formed by the dough filling out the folds of the cloth. Doughs which are the strongest in gluten will swell most. Also taste and smell.

Q. When choosing a flour for bread, biscuits, or cakes, what distinctive points or qualities should be sought for?

A. **For Bread.**—That containing a stable, good quality of gluten (the more of it the better), and has been subjected to first-class refinement or milling.

For Biscuits.—These only require a flour of "immobile" qualities, *i.e.,* one containing a low percentage of gluten, or a flour in which that constituent is soft and easily degraded.

For Cakes.—That containing plenty of gluten, but it must be of the soft and flabby variety. The process of cake and biscuit-making affects very little alteration in the condition of glutens, and they should therefore for this purpose be weak and soft. The amount of spring or change required in the cake governs the quantity of the gluten the flour should contain.

The higher the class of goods in any of the above divisions, and the more delicate the finish of the goods desired, the higher must be the quality of the grist from which the flour is made, as well as the skill in milling refinements.

The Technics of Cereals.

We may conveniently divide the constituents of the cereals into three classes. In the first group, those constituents which, by being burnt up in the system, produce heat. They are the materials which we call carbo-hydrates—the starch, the gums, and the sugars; it is from the oxidation of these carbo-hydrates, and also from the fat in our food, that the greater portion of the force which man exerts is derived. The next great division it will be convenient to take will be the albuminoids, or flesh-forming elements of the cereals; and lastly, the ash, which, although not great in quantity, is still most important in its bearing on the physiological phenomena which go on in the cells of animal life, and also because it is from the mineral matter of the ash that the bone structure of man is built up.

The ash of wheat contains nearly one-half of phosphoric acid.

There is also a small quantity of phosphate of iron. Phosphoric acid, potash, and magnesia are the characteristic constituents of the ash of wheat.

Formulæ of Carbo-hydrates.

$$\left.\begin{array}{l}\text{Starch}\\ \quad\text{and}\\ \text{Dextrin}\end{array}\right\}=(C^{12}H^{20}O^{10})n.$$

$$\left.\begin{array}{l}\text{Cane Sugar}\\ \quad\text{and}\\ \text{Maltose}\end{array}\right\}=(C^{12}H^{22}O^{11}).$$

$$\left.\begin{array}{l}\text{Dextrose}\\ \quad\text{and}\\ \text{Lævulose}\end{array}\right\}=(C^{12}H^{24}O^{12}).$$

We use that expression in order to indicate that hydrogen and oxygen are found in the carbo-hydrates, in precisely the same ratio as they occur in water. These two elements, hydrogen and oxygen, do not exist in starch or sugar as water; but they exist in the same proportion as they do in water, and that expression has been applied to all these bodies.

The next subdivision of this important class of bodies embraces cane-sugar and maltose.

They are isomeric—that is to say, that they have precisely the same ratio of carbon, hydrogen, and oxygen in their molecular composition—but they differ from the previous sub-groups in having one of oxygen and two of hydrogen more in the formula given. The last subdivision of this group embraces the glucoses, the simplest formula expressing their molecular composition being $C^{12}H^{24}O^{12}$. Here also we notice an increase of two of hydrogen and one of oxygen over the cane-sugar group, which differs from the starch group in the same manner.

Starch is the first on the list of the carbo-hydrates. Starch is found in various vegetable structures, and for much the same purpose as fat is stored up in animals, for the future use of the organism.

If you take the caryopsis of wheat, the small embryo will be found at the bottom, surrounded by a large mass of starchy matter. It contains not merely starch, but also albuminoid bodies, and this, in botany, is called the albumen of the seed; for the reason that in the case of an ordinary hen's egg, the white of the egg surrounding the embryo is called albumen, and in both cases the albumen serves for the future growth of the young embryo. Starch is also found very largely in the fleshy cotyledons of some seeds, as, for instance, the ordinary bean, horse-chestnut, or pea, where practically the whole mass is made up of the two thick fleshy leaves, which constitute the two halves of the whole seed, the young embryo being at the bottom. We see, therefore,

that in all structures which are intended for the future growth of the plant, or, as in the case of seeds, for the reproduction of the new plant, we find stored-up starch.

Starch, however obtained, consists of minute cells, averaging in diameter from hundreds to thousands of an inch, and these cells differ in size and also in form, according to their origin. All the starches have characteristic appearances under the microscope, and it is on account of the difference of form and the difference in size that we are able to determine the cereal from which it comes. All starches have *the same food-value, and exert the same influence* in the functioning of man or beast.

The Albuminoids and Proteids.—Their general composition is given in this table :—

Average Composition of Albuminoid and Proteid Matter.

Carbon	53·3
Hydrogen	7·1
Nitrogen	17·7
Oxygen	22·1
Sulphur	1·8
	100

The numbers given here will fairly indicate the general nature of the albuminoid bodies: Carbon, 53·3; hydrogen, 7·1; nitrogen, 17·7; oxygen, 21·1; sulphur, 1·8.

The albuminoids of wheat flour differ very much from those of the other cereals—10·9 is given to old wheat, 13·2 to barley, 16 to oats, 8·8 to rye, 8·9 to maize, 7·2 to rice. Oats and barley are very rich in albuminoids, wheat is pre-eminently rich in the proteine bodies, and the value of any given sample of wheat flour depends largely on the total quantity of albuminoids in the wheat.

In the husk of wheat, that which one separates under the name of bran, occurs another albuminoid body called cerealin. Cerealin has a very marked action upon starch; in other words, it acts as diastase and malt infusion, and the object of its being there, gathered together mainly in the bran, is for the purpose of enabling the young germinating plumule to obtain a large supply of nutriment, not entirely from the starch, but to a great extent from the cellulose structure of the outer layers of the corn. The cerealin, like many of the albuminoids, is precipitated by alcohol and also by acids. Now, these soluble bodies, legumin, albumen, and cerealin, one or more of them occur in all seeds, and the reason why they occur in seeds is that they thereby present, under the germinating process, precisely what chemists use in the researches upon starch, a material which has the power to

convert the starch, and even the cellulose, into soluble materials, because you will remember that starch and cellulose are insoluble in water, whereas, when converted into various sugar bodies, they dissolve, and can be absorbed by the cells of the young growing plant.

The tendency of all albuminoids, even those which are insoluble in water, and even that which is the most complex in its structure, namely, fibrin, is to degrade, to become less and less complex, and ultimately, of course, to become soluble in water. The degradation of molecular structure is communicated to the complex molecular structure of starch, so that the complexity of the starch undergoing the peculiar degrading action which goes on in the albuminoid molecule is itself converted into molecules less complex than starch, namely, into maltose and dextrine; in some cases there may be also the production of other sugars. We see, then, that the albuminoids are powerful degraders, or breakers down of the complexity of molecular structures. But that is not the only interesting point connected with nitrogen. Curiously enough, we speak of nitrogen as being inert, and as being merely used, as it were, for the purpose of diluting the oxygen of the atmosphere; hence we are all very liable to look upon nitrogen as playing a comparatively unimportant *rôle* in the phenomena of Nature; and yet, strangely enough, were it not for the action of nitrogen, or rather of the compounds of nitrogen, there would be no life whatever in this world; there could be no simple cell even built up without the action of this marvellous architect—the nitrogenous compound. Every cell-structure, and, of course, every large aggregation of cell-structures, such as an oak tree or a man, containing many millions of cell-structures, are all built up by the wonderful agency of nitrogen, or rather of its compounds. But while nitrogen is so important an agent, so marvellous a builder up, it is for very similar reasons equally powerful in breaking down. Whenever you have albuminoids present, if there be moisture sufficient, and if there be warmth sufficient, there you have the agent ready for degradation.

Flour may be relatively or potentially, rather than actively, bad. It is hardly speaking correctly when we talk of *bad* flour; some good is positively present in all flours, and it would be preferable to speak of certain kinds as being suitable or unsuitable for the purpose required. The flour that would be classed A1 in a prison, poorhouse, or by the Army or Navy commissariat, would be called rubbish by the city baker; and what the city baker would class as good, the *chef* or baker of the upper classes would look upon as inferior; and what he says is excellent, the whole-meal advocate would put down as positively injurious to health. Flour is only relatively good or bad according to the uses to which it is put.

Flours are usually divided into three Chief Grades.—

American	Equivalent in English.
Patents	Whites.
1st Bakers	Households.
2nd Bakers	No. 2's.

But the up and down varieties of these grades—both English and American—are very numerous. Some millers make a speciality of one grade, and make the best they can of the by-products of that grade; in some cases as many as five different classes from the one grist of wheat. Others do not make such acute or so many divisions, but endeavour to make standard 1st, 2nd, and 3rd grades, each within a shilling or so value of the other. It will not be safe, therefore, to buy flour by the name of its grade. For the quality of that particular grade will depend upon the number of grades made out of the same grist of wheat. As a matter of opinion, I believe the English mode of classification preferable to that of America, and if the responsible English miller will be content with the profits obtained by the American, and imitate him in his progressive milling, and put as much brains into it as he of America does, then the English baker, handling whites, supers, households, and No. 2's, will be safer than when handling the 1st and 2nd patents and 1st and 2nd bakers' grades of the firms beyond the seas; but in either case, the baker must depend upon his own knowledge to test his flour, for in few cases does the name of the firm or the name of the grade give him the security sufficient to dispense with such knowledge, or to save him from a money loss.

The important and clever improvements in milling machinery have paved the way for the technically and commercially educated miller to change the nomenclature of his flour, hence the names Patents, Bakers, and Straights. Rolls enable the miller to obtain flour from the heart of the wheat minus the germ and the bran, which are cast out and not ground in, and *partly* dressed out, as in the case of stone milled flour. **Patents** are good all-round flours, but will differ in quality and commercial value in ratio to the quality of the wheat employed in their making, the quantity of patents taken off the grist, combined with the fineness of the dressing.

Straight Grade Flour

is the name given to flour obtained from wheat without any part being taken away, or having any other kind of flour added to it, and its value to the baker will depend upon the quality of the wheat used. Straight Grade flours are necessarily strong, dark,

and coarse flavoured, owing to the insufficient dressing. To dress them finely would be to take away some of the flour, and then it would not be a Straight Grade.

Bakers' Grade Flour

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is the residue of grists from which the patents have been taken—forty, fifty, or sixty per cent., differing in quantity in different mills; the prevalent custom being to have hoppers and spouts fixed at suitable junctions, from which is run into this residue, as it passes along, either a bought flour from other mills or a straight run flour of an inferior grist of the same mill, and any other suitable flour. Bakers' Grades are coarse-flavoured, dark, strong flours. (Bakers should resent having their names put to this worst class of flour.)

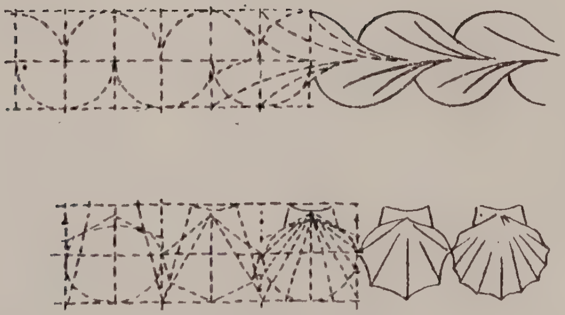
Whites and Country Whites.

The acute difference in quality of these flours will forcibly explain what I have been trying to show in reference to the delusion and snare involved in buying flour by name. The practice of London mills is to make Whites their standard and best flour. The Whites of provincial mills is the worst flour made, and up to 1890 the term Country Whites was synonymous with all that is weak and "wish-washy" in flour, and it must be remembered that there is no law to make millers designate their flours correctly, and Patents and Whites may not be what they are named. A "High Ground" granulated flour, rough to the touch, and that will not form a ball, but breaks and separates easily, is evidence that not much, if any, of the best parts have been taken out of it; but its actual value will depend upon the quality of the grist used, the amount of the best part it contains, the amount of the worst parts taken away, and the mode of its dressing. A flour that forms a ball when squeezed in the hand, that feels woolly, that feels soft and greasy when rubbed between the fingers, and that forms beads or peas when taking the sample paper containing it with both hands and making a rapid circular motion, shows that it is a damp, damaged, or residue flour from which the best has been taken, and its value will depend on how much has been taken from it, and also upon its condition and dressing.

When buying flours for use in his business, the baker should strive to obtain a flour that will keep his bread uniform. This is the most important essential, as few things tend to disturb a connection so much as bread of a varying quality, especially when there is plenty of competition. Experience in business proves that a larger or whiter loaf is nearly as disturbing as a smaller or

darker one, for unless that whiteness is kept up, "it will only serve to make the darkness more visible" when it returns; therefore always aim to obtain uniformity in size, colour, and flavour.

Buy your flour as you buy other goods, from firms of good reputation, who know the baker's requirements, and specially cater to supply them. Why do not bakers buy flour as they buy butter and confectionery, with a guarantee from the flour-sellers that no adulterants are mixed with it, that it contains a certain percentage of gluten, that it will absorb so many quarts of water to the sack, and that its colour is number so-and-so in the colour scale?



Copy for Piping Practice.

YEAST

Q. What is yeast?

A. A vitalised organic substance—an amazing, wonderful embodiment of what is called "life"; a living and moving organism, compounded of fluids, solids, and organs, capable of infinite reproduction, and whose existence is dependent upon a vital force within its own economy which is sustained by assimilated nutriment. Yeast is an organism whose form and structure are so minute that the human eye cannot see them unaided by the microscope.

This life, this organism, possesses the power to assimilate and vitalise matter, and to transport it into the living elements of its own structure. It is an organism which partakes both of the nature of an animal and a plant, and in botany is classed with the fungus known as *Saccharomyces cerevisiæ*—a sugar fermenter. When a single cell is examined with the aid of a powerful magnifier, it is seen to consist of protoplasm (the base of all life), contained in a complete envelope of thin skin without opening of any kind. It is from this plasmic nidus that the young cells are formed when the parent cell is placed in an environment wherein it can obtain its natural nutriment and exercise its proper functions. Reproduction takes place by "budding." A swelling forms upon the outside of the envelope, and as it grows gradually detaches itself and eventually becomes a separate cell, which in its turn becomes the parent of other cells. Occasionally the reproduction is from spores (seeds or eggs). These originate in the old cell, which when it breaks up liberates the spores. If this takes place in a proper medium, these spores germinate and become parent cells, like the cells produced by "budding."

Yeast reproduces itself with amazing rapidity; a few cells being planted will in a few hours multiply into millions.

Q. What is the most suitable medium for the cultivation of yeast?

A. The yeast organism occupies a place very low down in the scale of organic life, and it was very difficult in the early days of yeast investigation to ascertain this. As the result, however, of careful observation, assisted by chemical analysis, it has been found that the yeast cell is composed of cellulose, albuminoids, fat, glycerine, and mineral matter, the carbo-hydrates forming the material of the cell membrane, and the nitrogenous matter the protoplasm.

It may be mentioned here that, chemically, the composition of wheat, gluten, and yeast are nearly identical.

It is apparent that these elements must be acquired by nutrition, which, in the case of a yeast cell, is by the process known as ingestion. The cells possess no mouth or other opening, and as nutriment can only be absorbed through its walls, it must first be solved, and the nitrogenous matter in it peptonised.

An analysis of flour and malted grain has shown that all the elements referred to as being necessary for the building up of the yeast cell structure are present in flour and grain. These commodities provide, therefore, a very suitable medium for yeast cultivation.

Q. If the elements of its nutrition must be in a digested condition, how does yeast obtain them from flour during bread-making?

A. Yeast cannot assimilate dry or solid matter, therefore the flour must be moistened. In a baker's sponge or dough this condition is present, the water in it dissolving the sugar and soluble albuminous matter. Yeast contains within itself a digestive principle called Zymase, which has the same function, and acts in the same way as pepsin and ptyalin (the digestive juices of human beings), and the digestive agents of wheat and malt, diastase and cerealin. This Zymase, with the help of any of the other diastasic digestive agents which may be present in the flour sets up diastasis (digestion), and the yeast ingests this changed matter, using what it requires of it to build up its structure, and for the supply of its respiratory oxygen.

> *Note.*—The molecular changes going on in the physical character of the constituents of the sponge and dough are partly due to the action of yeast, and partly due to other agencies. Most of its constituents will have undergone some degree of change. The gluten will be degraded, peptonised, and the starch cells ruptured, thus freeing their granules, which will become gelatinised in the baking, some being changed into sugar, and left as sugar unconsumed by the yeast. This is a condition of good bread.

Q. What are the products of yeast during the process of fermentation? Explain the mode by which the various changes are effected.

A. Yeast, during fermentation, consumes or digests the inverted sugars in flours ($C^6H^{12}O^6$ Glucose, and $C^{12}H^{22}O^{11}$ Maltose), and during this digestive process the molecules composing the sugar are decomposed, and separated into their elements of carbon, hydrogen and oxygen, which are then rearranged, in the proportion of one-third of the carbon and two-thirds of the oxygen, to form a gas known as carbonic acid (Carbon dioxide CO_2), and the whole

of the hydrogen, and the remaining two thirds of carbon, and one-third oxygen combine and form alcohol C^2H^5HO. A little of the sugar is used by the yeast for its respiratory oxygen, and for the cellulose with which to build up the walls of its envelope or skin membrane.

For the 100 parts of sugar fermented by yeast there is returned in the form of its excreta three parts of glycerine and succinic acid, 96 parts of gas and alcohol in nearly equal proportions, the remaining one part being used by the yeast in building up its own structure and lost as waste.

Q. Which degree of temperature has been proved to be the most suitable to yeast life?

A. The most healthy temperature for "baker's" yeast growth is between 70° F. and 80° F. At this temperature, when sown in a suitable medium, it functions steadily, and reproduces vigorous young cells, and for the processes of bread-making extending over twelve hours is the most suitable. Between 80° F. and 90° F. the activity of yeast is increased, it ferments more quickly, and between 90° F. and 100° F. still more rapidly; but it is not the healthy growth of that at 80° F., it is a gallop, and that being so, the time of the process should be very short. The faster the working the more quickly it will be finished. Between 110° F. and 120° F. yeast functions with a feverish activity which quickly enervates it, and the length of the time it is subjected to such a temperature must be as limited as possible for the work in hand.

Yeast will live up to 140° F.; at that temperature its protoplasm is coagulated, and dies.

The effect of reducing the temperature below 70° F. has an opposite effect. At 50° F. the cell is numbed, at 40° F. it becomes torpid, and if subjected to that low temperature for a few days, its resuscitation will be doubtful.

Q. What effect has salt and fat upon yeast?

A. Salt in ordinary quantities does not interfere with the functioning of yeast. Salt has a hardening, preserving effect upon all tissues, and therefore those of yeast become hardened when in contact with it, and it will depend upon the quantity of salt used whether the tissue is hardened to the extent of preventing active living. If 4 lbs. of salt with the water were mixed with only a few pounds of flour, it would seriously retard the free working of the yeast, but if 4 lbs. of salt were used to 280 lbs. of flour, and the necessary water to make it into dough, neither the tissue of the yeast or the flour would be unduly hardened.

Fat does not kill yeast, but prevents it working freely as a ferment in much the same way as "oil stills the troubled waters"

—there is no grip, and therefore no commotion, no foaming, and not much gas.

Q. If a ferment remains unused for several hours after it is ready, *i.e.*, has subsided, what will be the effect upon the bread made from it?

A. By remaining unused for any length of time after the first hour of subsiding, the yeast in the ferment will lose some of its vitality, and result in the acid-making germs having sufficient time to produce unpleasant flavours. During the stirring and pouring, in the process of mixing the materials employed, there is incorporated with it a supply of air. As soon as the mixing is complete, the yeast, with the aid of this air, quickly begins to function, and CO_2 results, which by reason of its volatile nature soon permeates the whole mixture. Being lighter, as a free gas, than the other parts of the mixture, it rises to the top, and in the ascent carries with it some of the yeast cells and the viscous matter entangled by it, the whole at the top forming a foaming, frothy head. This continues until the yeast, satiated with its food, rests and subsides. The frothing mass at the top settles down and forms a compact mass, covering the entire top of the vessel the mixture is placed in. The yeast operates languidly, and a little more gas is formed and helps to expel the air that is left, or if not expel, to carry it up to the caked surface, and with it to form a *gaseous stratum* through which the outer air cannot pass into the mixture, nor the excreted gas escape out of it. The greater the vitality and vigorous working of the yeast, the greater the volume of gas evolved, and the more dense the surface will be. The yeast, deprived of fresh oxygen, and comfortably full of its aliment, slowly settles into a lethargic state, and becomes torpid. The young cells which have been and are being produced thrive but poorly, because of the presence of their poison CO_2. In this state there is very little fermentation to be seen from the outside, though there is a little going on inside. Young and old cells are making a languid effort to work, and small quantities of gas and alcohol are being formed, and these only make the continued activity of the cells more uncertain.

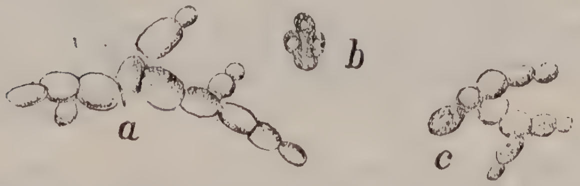
The belief prevalent among bakers is that when a "ferment" or sponge settles down and stops working, it is because the yeast has consumed all the suitable aliment present, and therefore stops working, waiting for more. This is not correct. It is impossible that all the starch has been changed into soluble matter, sugar, etc.

The inert condition of the ferment, sponge or dough, results from the inability of the yeast to function under the conditions which environ it, and therefore the weakest of the cells lie

emasculated and dying, reproduction by budding ceases, and reproduction by seeds (spores) waits for the breaking up of the old cells and suitable conditions, before it can take place. A little longer in its quiescent state and the sweet taste of the ferment becomes a sour one, and except for a few hardy specimens, the living yeast has disappeared, and whole colonies of the acid and disease-causing (in bread) germs have taken their place.

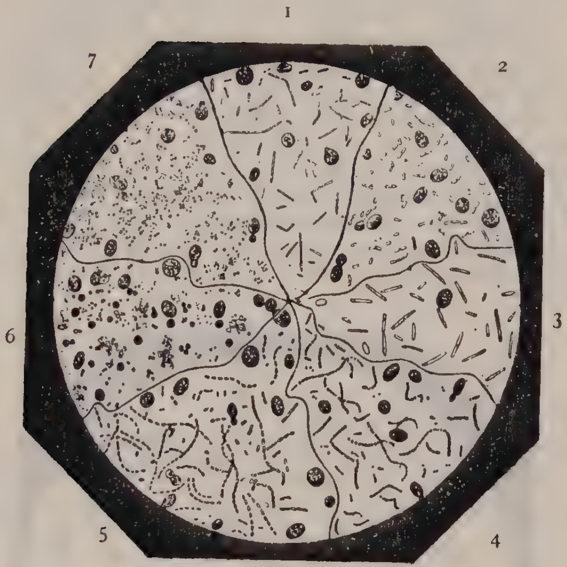
It is true that there is a certain amount of aeration caused by CO_2 made up from a stale ferment; true that every sign of the presence of yeast has not vanished; but it is also true (though exceptions have been known) that the bread will be bad to look at and bad to eat. The degree of this bad quality will depend upon the length of time the ferment has been left unused after subsiding.

> *Note.*—The term *ferment* has a different meaning when used by bakers to that employed by scientists. There are several organisms which function as ferments, but when first discovered scientists named them after their products, such as the alcoholic ferment, those which produced alcohol; lactic ferment, those which produced lactic acid, etc. A ferment is the cause, and not the effect.
>
> The bread-maker should always remember that when using yeast, he has arrayed thousands of active cells against each single cell of bacteria (which by chance may have found its way into the mixture), and that with ordinary knowledge and care these thousands may always be relied upon to finish the task allotted to them before the single cells of the bacteria can spoil it.



YEAST CELLS.

(*a*) *Highly magnified, cultivated healthy cells, budding and ready for use in bread-making.* (*b*) *Mature spores.* (*c*) *Spores germinated, vigorous young cells.*



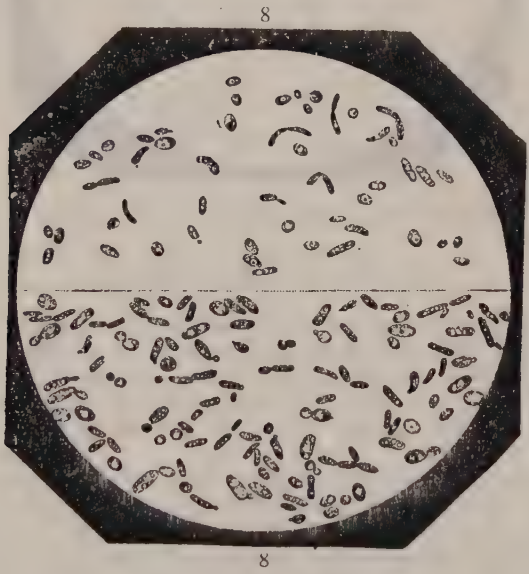
DISEASE GERMS, WITH YEAST CELLS.

Section (1) *a growth of the same tribe as B. Lactis, and acid-maker.* (2) *Bacterium Lactis, acid-maker, the organism of the lactic acid ferment of milk.* (3) *Sometimes named Bacillus Subtilus, the maker of butyric acid.* (4) *and* (5) *Of the tribe Mycoderma Aceti, acid-makers—acetic acid.* (6) *and* (7) *Of the tribe Cocci Micrococcus, organisms whose work is accompanied by unpleasant odours; the active agents in the liquefaction of tissues, and an auxiliary in the work of the incipient putrefaction of cold, slimy, ropy dough.*

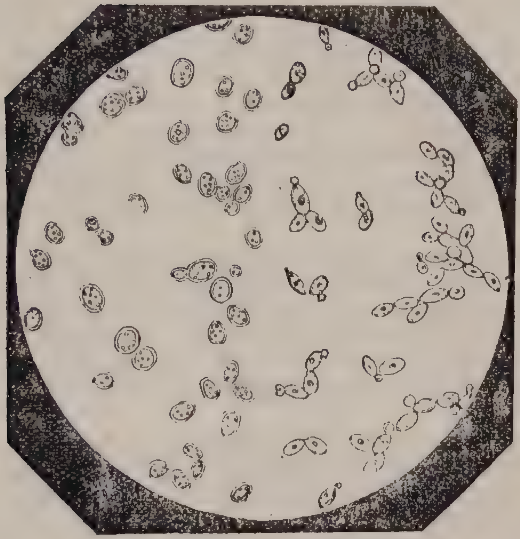
(8) These two types of *Mycoderma vini* are often noticed upon the surface of beer and wine. They can be recognised as whitish wrinkled films that do not mix with the liquid, nor mix with it in a manner to become soluble in it, but break up into pieces. Microscopically examined, this film is found to be composed of countless globules, having a likeness in shape to some of the yeasts, but with different functions. It arrests the oxygen of the air, and holds it on to the liquid upon which they rest. It acts usually as an air life organism (Aerobic, an organism that works best in contact with

the air). It changes the sugar and alcohol, and also the odorous flavours which help to make bread nice to the taste, and though not developed enough to be *seen* in a baker's "ferment" that has stood, after it is ready, for several hours, it is most likely at work upon it, and the resulting bread will lack aroma and flavour.

Two more of the tribe of *Mucedinicæ—penicillium* and *aspergillus*—better known as moulds and mildews, are the germ workers, whose product is the blue and yellowish green moulds to be seen upon old bread, jam, and cheese. They sink deep into the nutritive medium, while their organs of fructification rise into the air. The mycelia filaments and sporiferous tubes, branches and bunches of spherical spores, are different in each; the mycoderms which appear upon the surface of the baker's stale "ferment," upon baked loaves, preserves, etc. For though the baker and confectioner may consider that their work and responsibility are ended when the loaf is baked and the preserves are potted, the susceptibility of the loaf and the jam to the attacks of these organisms will depend very much upon the thoroughness of the baking, boiling, and potting. The more complete the evaporation of moisture and exclusion of air, the more difficulty there will be for these germs to vigorously function.



MYCODERMA VINI.



YEAST CELLS, SHOWING BUDS AND SPORES.

Further Points on Yeast.

It is necessary to remember that yeast may be inherently bad when its cells are weak or old, or it may be bad through the presence of foreign impurities, or it may become bad in keeping. In the event of its having become feeble, it may be greatly assisted by *good nursing*, by gentle warmth, and by suitable nourishment.

In making choice of yeast, it will not do to be governed entirely by the reports of specialists who write testimonials, because they do not—nor should they—publish comparative tests, without which it is impossible to accurately ascertain the *relative* values of different kinds of yeast. The testimonials may state that the yeast submitted to microscopical examination, or to a baking test, was very good, or contrariwise; further than that it cannot *fairly* go. But this, however, does not prove that this particular yeast is better value for money than the yeast we may be using; nor will it do to be governed by such statements as, "The size of loaves was good, flavour excellent, the pile glossy, and bloom good." This description does not convey a correct idea by any means, and would apply with far greater accuracy to the *quality* of the flour, and not to that of the yeast. There are flours that

would not answer to this description in any one particular, whatever kind of yeast had been used by the baker. On the contrary, there are flours that would turn out such bread, though a very inferior yeast had been used in its make-up. Therefore such statements prove very little. Yeast is only good or bad relatively, by comparison with a better or worse—as indeed are all other things. That is to say, there is no fixed standard to judge yeast by; the safest and only way is to judge it by comparison, and to prove that it is relatively bad or good, by *testing* with a better or worse yeast.

Yeast, having no mouth, *ingests* or draws its food through the cellulose which composes the walls of its cells, and therefore its nourishment must be of crystallisable nature, such as sugar and amides in solution; these pass inside easily, while starch in solution, or undissolved, or gluten in solution, will not do so until the starch has been converted into sugar and the gluten into peptons.

Yeast both rises to the surface and subsides to the bottom of a fermenting liquid. The scum and dregs of this process were first examined by the microscope in the latter part of the seventeenth century, by Leuvenhock, who found that they consisted of minute particles of a definite shape, ranging in size from $\frac{1}{2000}$ to $\frac{1}{7000}$ of an inch in length. Cagniard de la Tour and Schwann, in 1835, a century later, made the remarkable discovery that these particles were living, growing, and multiplying, their multiplication taking place at a prodigious rate, by a process of budding. An Italian chemist, Fabroni, discovered the nature of oval yeast particles to be that of cells, composed of a special variety of cellulose, and containing fluid matter, consisting of the elements carbon, hydrogen, oxygen, and nitrogen, in the form of an albuminous substance.

Van Helmont, a Dutch chemist, so far back as the commencement of the sixteenth century, recognised the gas evolved during fermentation as identical with such as is found in caves, wells, and cellars. Lavosier examined the change produced in sugar by fermentation, and proved that nearly the whole weight of the sugar is represented by the sum of the weights of the alcohol and of the carbonic acid produced. In accordance with this fact, we say that the sugar is resolved into alcohol and carbonic acid. The part that the yeast plays in this change was undetermined until the year 1845, when Von Helmholtz discovered that it is the living yeast-cell, or at any rate something inside the cell, which is the active ferment. It is a well-established fact, which no one now can call in question, that the chemical and physical phenomena already mentioned, namely, the resolution of sugar into carbonic acid and alcohol, and the upheaval or foaming of the mass, are

intimately connected in some way or other with the life of a minute cellular fungus. When the life of the cells is destroyed by poison, the act of fermentation ceases. When the life of the cells is active by reason of a genial warmth, the presence of mineral food, albuminous matter, and sugar, then fermentation is briskly carried on. By the addition of a very small quantity of yeast to wort, a multitude of living cells are introduced into a liquid medium adapted in the highest degree to their nutrition, and they are thus capable of vegetating with extraordinary rapidity.

If we examine a speck of yeast under the microscope with a high magnifying power, we observe that certain of the cells are more or less elongated, while others are more nearly spherical in shape, and they are all isolated. In many of them there are apparently vacant spaces which are lighter or darker than the surrounding parts of the cell according as the object or the object-glass is slightly shifted. Granulations, too, are seen in the cells, and they present altogether a somewhat shrivelled appearance, or sometimes they string together like small sausages, cannibal-like living upon each other. Such cells are suffering from deficient nutrition and insufficiency of food; they are, in fact, half starved. If they be transferred to some fresh wort, and placed in shallow vessels so that they are freely exposed to the air, their appearance will be greatly improved. They will be seen to have filled out and become fatter, while the vacuoles or vacant spaces have disappeared, the granulations are scarcely visible, and the distended cell-walls are difficult to see; they are nearly all budding, and the buds are at different stages of development. The characters of the two conditions of yeast may be shortly summed up as follows:

Old Cells.—Isolation and granulation; shrinking of the protoplasm to the cell-wall and creation of vacuoles; shrivelled appearance.

Revived Cells.—Cells distended; appear transparent to a greater degree; budding and growth of buds until detachment; interior gelatinous matter contains fine granulations not easily seen, but appearing brilliant at a certain magnification.

As yeast is a plant of low organisation, it is necessary to supply it with the mineral and organic material such as will contribute to the formation of fresh protoplasm during reproduction and development. To ascertain what these are, we must turn to chemical analysis for our knowledge—Purified yeast contains:

Carbon	49·9	per cent.
Hydrogen	6·5	,,
Nitrogen	12·1	,,
Oxygen	31·4	,,
Ash	2·5	,,

And consists of:

Cellulose, gum, and cell-membrance ...	37 per cent.
Albuminoids	45 ,,
Peptones	2 ,,
Fat...	5 ,,
Extractives (leucine, dextrin, glycerine, succinic acid)	4 ,,
Ash	7 ,,

It will be seen that nitrogen is a very important element, and nitrogenous matters must be a necessary form of nutriment for yeast; for the fermentations of solutions containing a deficiency of such material, leguminous seeds, such as beans, should be steamed, and the mash so prepared be added to that about to undergo fermentation. The reason for this proposal lies in the fact that the leguminosæ are rich in a nitrogenous substance called asparagin, which has been found to be an excellent nutritive material for the yeast plant. Its composition is $C_4H_8N_2O_3$; it is closely related to mallic acid, as likewise is aspartic acid.

It is a well-known fact that yeast can derive its nitrogen and carbon from ammonia salts of organic acids, as, for instance, ammonium tartrate.

There are several kinds of yeast which produce alcohol during fermentation; they are named as follows:

1.	Saccharomyces	Cerevisiæ	(Baker's)
2.	,,	Ellipsoideus	
3.	,,	Conglomeratus	
4	,,	Exiginus	
5.	,,	Pastorianus	
6.	,,	Minor	
7.	,,	Mycoderma	

Some organisms can oxidise alcohol into acetic acid; the *Bacillus amylobacter*, and the *Bacillus subtilis*, yield lactic and butyric acids from even cellulose, starch and sugar. *Mucor mucedo*, *Mucor stolonifer*, and *Penicillium glaucum* are common forms of mouldiness; the presence of the former, which are named *bacteria*, or rod-like organisms, cannot be recognised without the aid of a microscope.

There are other kinds of yeast besides those used by bakers and brewers. The name of yeast is also given to a number of what may be termed wild or uncultivated types of fungi and other tiny organisms that can act as yeast and produce carbonic acid and alcohol from sugar; but an important difference exists between the shape and appearance as well as the character of these yeasts, as compared with what is called baker's yeast, just

as there is a great difference between a wild crab-apple and a beautiful rosy pippin. This *Saccharomyces cerevisiæ* used in baking is a highly cultivated yeast, and is the result of a continuous effort on the part of the yeast cultivator to produce a yeast as free as possible from any admixture of these wild types and other disease germs.

The disease-organisms are small rod-like or thread-like bodies, and much smaller in size than the yeast-cells, and more difficult to observe, so that a magnifying power of not less than 400 diameters, with glasses capable of the best definition, are necessary. It is better to employ objectives with a magnifying power of 750 to 1,000 diameters. Were these disease-organisms absent, acetous fermentation could not take place.

Yeast may be inherently bad when its cells are faint or old, or it may be bad through the presence of foreign impurities, or it may become bad in keeping.

The Appearance of Weak, Exhausted, and Impure Yeast.

Referring to weak and exhausted compressed yeast, it looks dull, and feels soft and sticky to the fingers, or breaks up into small warm crumbs, not breaking with a free, clean fracture; the smell of it will not be that of sound acid fruit, such as apples, but that of tainted meat or fish. If the yeast has been stored for a day or so, it will feel to the hands, and show by thermometer, warmer than the atmosphere where it has been stored. In proportion as it is warmer will it be bad. These are sure tests for soundness or unsoundness of yeast, and no microscope is needed. But to detect impurities and their nature involves microscopic work, and will require careful, watchful attention and practice. When looking at yeast through a microscope, if it is seen to have inside the cells a number of dark specks, and the outer skin has a crinkled, shrivelled appearance, it has become too exhausted to properly do its work; or if the yeast has scattered amongst its cells a number of organisms like short pieces of thread or other germs, not round or oval, which is the shape of the true yeast, it is then unfit for bread-making, and contains impurities in the shape of bacterial organisms, that the brewer or distiller by careless workmanship has permitted to get in it from the air and from unclean utensils. The ordinary commonplace collector of yeast in the brewery is unmindful of the baker's need—he merely collects so much weight, that will fetch his firm so much per pound; the baker's safest plan is to have nothing to do with him, but buy only high-class yeasts. If compelled to use faint or impure yeast—*because you cannot get any other*—use

nearly double the quantity of yeast, and don't expect too much work from it; be content with small sweet bread, obtained from a quick fermentation at a temperature of about 90° F.

It must be as true of yeast as of all other life, that there is a condition of growth more suitable to it than any other. Ascertain, therefore, what are the most suitable surroundings for healthy yeast life and reproduction, and then never depart from these conditions, whatever the pressure. The one great reason for this is, that science and observation both endorse the statement that, as soon as a medium becomes *unhealthy* for yeast, it becomes *healthy* for the growth of one or the other of the disease germs, and that these germs lie dormant when the conditions are opposed to their activity, and even when they may live in these unsuitable conditions, their growth and reproduction is nothing worth noticing; but when the conditions are favourable, they are then set completely free and multiply very quickly. This is as true of lactic and butyric germs as it is of all kinds of yeast. Every form of life has its sphere and food. Neither moths, mushrooms, nor flies will germinate in brine or quicklime, and though they may pre-exist in some form, they must have a medium as a matrix in which to develop and reproduce their species. The cheese affords a matrix for the cheese mite, or it would remain undeveloped and devoid of a means to mature and reproduce itself. This is the great truth I would have you learn. No matter how low we descend, it still holds good through all forms of microbic life the same. In just so much as these microbes differ in their nature, so much will they differ in the suitability of the medium of their sustenance and life: a smelt and a tadpole will not thrive equally in the same surroundings. Therefore ascertain the physical laws governing the healthy reproduction of yeast life, obey the rules that law lays down, and you will be quite free from the effects of other foreign germs.

Beer Yeast—Mode of Working.—Put in a ferment, with $\frac{1}{8}$ of the total water at 84 degs., a handful of flour and some other yeast food, allowing one pint of yeast to every 140 lbs. of flour to be made up. Let this ferment until fermentation begins to subside, and then strain it into the trough, and add half of the total water at a heat sufficient to bring the added flour up to 86 degs. Stir to a light spongy sponge, and allow to ferment six more hours, and until it has risen and subsided twice; then add the remaining half of water at a heat sufficient to bring the heat of dough up to 86 degs., and 2 lbs. of salt; break up the sponge and this added water together quite smooth, and then make the whole into dough, which should rise for about two hours, and then be taken out of trough, scaled off, moulded and baked.

Brewer's Compressed or Dry Yeast is produced by evaporating the moisture of ordinary brewer's yeast, and compressing the residuum. It possesses the qualities of thick yeast, and is coming into greater favour every day, because the baker is handling a certain quantity of yeast in the dry, and a very uncertain quantity in the semi-liquid. Quantity to use: 6 ozs. to the bag of 140 lbs. Mode same as thick yeast.

Compound Barm, Comp., Compo., and Patent is the same yeast under different names. It is a malt-and-hop yeast, and is essentially a baker's home-made brew. In a few large towns there are compound barm or patent yeast brewers who make it in quantities and retail it out to bakers who do not want the trouble, or do not know how to make it. It is this wholesale manufacture of comp. that has ruined it. Of course, it could not be made, carted, and delivered as cheap as the baker could make it himself, with no charge upon it for labour; and to compensate for these extra expenses the yeast brewer has drawn very freely from the water-tank. The mode of making these malt-and-hop yeasts does not vary much throughout the United Kingdom, the chief variation being in the different quantities of malt and hops used to a given quantity of water.

Mode of Working.—To make 140 lbs. flour with "Patent" "Compound Barm" yeast, use 3 pints, and proceed the same as for brewer's yeast; but owing to the limited number of yeast cells usually present, this yeast requires a longer time in the various stages to permit of growth and multiplication, sufficient to enable it to do the work required: About eight hours in the ferment, eight hours in sponge, and three hours in dough, with 2 lbs. of salt to the 140 lbs. flour, to keep down the growth of acid-producing germs which are sure to be present in these long process fermentations, as well as to add flavour in the room of the natural flavour of the flour, which has been consumed by the yeast. The guiding principle in working this yeast is—plenty of time and plenty of salt.

How to Grow Malt-and-Hop Yeast.

In writing directions how to grow yeast for bakers' use, we have been mindful that there are others who make bread besides bakers, and there will be found in this work some household recipes for yeast-growing. We have also been mindful that bakers do not always reside in cities and work in bakeries; sometimes they go to sea in ships, or dwell among the mountains; occasionally they march with armies, and in the explorers' company; and in many other places and ways have to mke shift with a different type of yeast to aerate their bread. It will,

therefore, be useful to give with these directions a few examples of aerating agents that will ferment bread when yeast proper is not obtainable. For convenience, I will class them as yeasts.

General Principles to be observed when growing Yeasts.

Never boil or scald the malt, because, like overdone meat, it will be hard to digest. Meat that has been much roasted or boiled is chemically changed, and resists the action of the digestive fluid. *Boiled* or *cooked malt* will not readily lend itself to assimilation with the other constituents of the brewing tub. It will require considerable digesting before doing much work, and the wort will be sluggish and dead; 150 to 170° F. is a good heat to mash malt, and quite sufficient to liberate or extract the principles required.

Hops should be boiled, but not allowed to stew; some bakers put them into the oven to stew for four or five hours. This is not wise; it causes a strong, rank flavour. Let them boil for five minutes briskly, and then let them cool down to about 150° F. before pouring upon the malt.

Crushed malt is always to be preferred. Buy the best malt and hops; money will be saved, because they will make a stronger soil in which to grow yeast, and the danger of imperfect work will be avoided.

Be sparing in the use of water; the more water you use when growing yeast, the more yeast will have to be used in making bread, and if so, where is the economy of using water too freely?

Important.—See that all utensils are well scalded with boiling water before using. Stale germs will probably set in motion lactic or other disease ferments, and spoil the brewing.

Patent Malt-and-Hop Store (or Compo) Yeast.

I. *Quantities.*—¼ lb. hops; 5 lbs. malt; 6 gals. water; 1 quart last store. Boil the hops with as much of the water as the vessel will allow of; boil at a gallop for five minutes, and then allow it to cool down to 150° F. by the thermometer; then pour it on to the malt in a tub, occasionally give it a good stir up with a stick, and when cooled to 75° F. by the glass (no guesswork here) add a quart of yeast from the last brewing; stir up, and strain into a flat tub large enough to allow for fermenting. Let the wort ferment for thirty hours; it will then be ready for use. One pint will ferment one bushel of flour.

II. *Quantities.*—10 gals. water; ½ lb. hops; boil quickly for five minutes; cool to 150° F., then mix with it 10 lbs. malt, stir well, and allow to remain in the mash two hours, then strain. If

possible, when straining, fasten the sieve as high as convenient above the tub, say about a foot; this will aerate and cool the liquor as it falls. When cooled to 75° F. put a $\frac{1}{4}$ lb. pure compressed; stir up, let it ferment about thirty hours. One pint to the bushel.

III. Boil for a few minutes as many hops as you can hold in your hand in 6 quarts of water. Let them cool for ten minutes, then pour the mixture upon 2 lbs. malt; let them mash an hour. It will then be cool enough to receive $\frac{1}{2}$ pint brewer's yeast. Stir this in briskly, strain into a tub, and leave to ferment about twenty-four hours.

Good yeast is made by using $\frac{1}{4}$ oz. of hops, $\frac{1}{4}$ oz. dried yeast, $\frac{1}{8}$ oz. salt, and $\frac{1}{2}$ lb. of crushed or ground malt to every quart of water. The principle of brewing this yeast is the same for all quantities, namely, boil the hops in the water for five minutes, let it cool to 160° F., stir in the malt, and let it stand covered up for three hours, then strain and squeeze all the liquor out, and let the liquor cool quickly to 70° F. Mix in the yeast and the salt, and let it work for twenty-four hours; it is then ready for use. You may use more water than the quantity named, but then you will have to use more yeast, and with this further drawback, that having a larger quantity of liquid, you will have a larger quantity of bacteria, simply because you have a larger space to collect them in. For example, assuming that most of these germs get into the yeast during the process of manufacture, it is reasonable to suppose that a surface of twelve inches square will catch more of them than a surface only half the size.

Flour Barm.

Quantities.—3$\frac{1}{2}$ lbs. malt; 3 ozs. hops; 2 ozs. salt; 2 ozs. sugar; 4 gals. boiling water; and 8 lbs. flour. Put the malt into a large tub to allow for working, and pour upon it 1 gal. water, as hot as it is possible for you to bear your hands in, or 150° F. by the glass; let this mash one and a half hours; also pour upon the hops 2 quarts *boiling* water, and let them mash. At the end of that time mix them together and strain; then stir in another tub about 8 lbs. flour, and a little warm water to mix it clear; then have an assistant with a stick to stir continually and rapidly, while you pour in from 10 to 12 quarts boiling water. Take turns about with the stirring for about five minutes, let cool to 170 degs., and then mix with the malt and hops. Leave this to ferment, exposed to the air twenty-four hours; then stir into it 2 ozs. sugar, 2 ozs. salt, $\frac{1}{2}$ lb. of flour, 1 oz. distiller's yeast, and place the tub uncovered in a sheltered place, where it will be comfortably warm. If in ten hours it is working freely, and full of life,

leave it alone; but if sluggish and dark-looking, dip your half gallon measure down to the bottom, bring it up full, lift it about a foot above the tub, and pour it slowly back; do it twice or thrice. This will let some air into its lungs, and help it to breathe more freely. Let it ferment two days before using. According to the state of the weather it will be necessary to move the tub into a warm or cool place. You should endeavour to keep it at about 78° F.

Parisian Barm.

Quantities.—4 lbs. malt; ¼ lb. hops; 4 gals. boiling water; 2 quarts last brewing; 8 lbs. flour. Mash the malt in a large tub by pouring upon it 1 gal. water, 150° F. Pour upon the hops 2 quarts boiling water, and let them mash for about an hour or so; then strain the hops; stir in 8 lbs. of flour, and stir vigorously while 10 to 12 quarts of boiling water are poured into it to make a scald; stir for a few minutes. When cooled to 76 degs., stir into it 2 quarts old barm; or, if you have not previously made this kind, and have no old flour barm, use 1 quart of malt-and-hops yeast; stir this up, and let it ferment about twenty to forty hours. It is recommended to scald the flour in another tub, and let cool to 150 degs. before adding malt and hops.

Flour used in the Place of Malt.—Boil 2 ozs. hops in 2 quarts of water a few minutes. Strain it, boiling, upon ½ lb. flour. Stir up, and when as cool as new milk, put into it ½ pint brewer's or malt-and-hops yeast; stir, and allow to ferment thirty hours, and it will be ready for use. Bottle a pint to use in the next store, instead of the brewer's yeast.

Handy Stop-gap Yeasts.

When malt-and-hops and other yeast are not obtainable; suitable for the housewife, and others who use only a small quantity of yeast.

Boil ¼ lb. flour and 2 ozs. sugar in 4 quarts water; let it cool to blood heat. Add ½ gill of brewer's yeast, or 1 oz. dried; put into a vessel to ferment for two days, bottle, and keep in a cool place. Keep a pint of this for the next brewing, and use in place of the brewer's yeast, if that is not obtainable.

To keep Yeast fresh.

All compressed yeasts should be kept in a close, firm mass: crumbs should be slightly sprinkled with cold water, and lightly worked into a lump. Keep dry and cold, and free from air. Like all life, when age overtakes it, decay soon sets in. Do not

keep in a refrigerator with ice in summer, nor too near the fire in winter; neither freeze nor scorch. In hot weather damp the dried yeasts, and pack closely in a pan or jar, tie up and bury in sand or earth; brewer's and malt-and-hop yeasts put in bottles, cork, and serve ditto.

Paper and canvas parcels, as soon as they arrive by rail or parcels posts, should be dipped into cold water a second, and then put in a cold cellar; when absolutely necessary to keep it some time, it is a very good plan to half fill a pan, cover with cold water, and then bury the pan up to the top in a cool corner of the garden; put a board over the top.

To strengthen and revive Old or Weak Yeast.

If you cannot by any means get better—mix 1 oz. of textis with a quart of water 70° F., and a quart or ½ lb. of yeast. Stir all together, and let it stand for twelve hours; use them in the ordinary way, counting only the yeast in your measurement, and not the water.

To cleanse Bitter Brewer's Yeast.

Put it into a pan and pour on it some cold water, stir it gently, and let it settle for a few hours. The yeast will sink to the bottom, and the water can be poured off, which will carry off most of the coarse flavour of the hops and colouring matter, etc.

Compressed, Distiller's, and "Dried" Yeasts are the result of a special effort of modern skill and enterprise to make a yeast specially for bakers. And without doubt these yeasts are a most decided improvement upon all the other kinds hitherto used in bread-making, combining, as they do, vigour of work with certainty of action. The chief difference between distiller's yeast and brewer's yeast consists in the fact that the yeast of the brewery is obtained when brewing malt liquors—ale, beer, stout—and the yeast is necessarily coloured by that of the beer from which it is taken, pale amber, light or dark brown; the product of the distillery, on the other hand, is free from added colouring and flavouring matters at the stage when the yeast is formed and taken from it, the fermented wort being for distillation into spirit, and not for drinking, as in the case of the wort for beer. This is the reason why distiller's compressed is much whiter than brewer's compressed.

The distiller allows fermentation to proceed until the whole of the saccharine in the liquid is turned into alcohol, the carbonic acid also passing away. When fermentation has stopped, the wort is removed to the wash charger, and thence to the still—a copper boiler with closed head -to which is attached a copper

pipe called the worm, descending through a large tub filled with cold water in constant circulation. Fire or steam applied to the still cause the contents to boil, the vapour arising therefrom passes through the worm, and is consequently condensed, issuing from the end of the worm as a liquid known in the distillery as "Low wines." This is redistilled, and it is here, if anywhere, that the colouring and flavouring matter is added; but in the case of malt liquors, these things—hops, quassia, burnt sugar, etc.,—are put into the wort during the actual fermentation, and must therefore be more or less in or on the yeast.

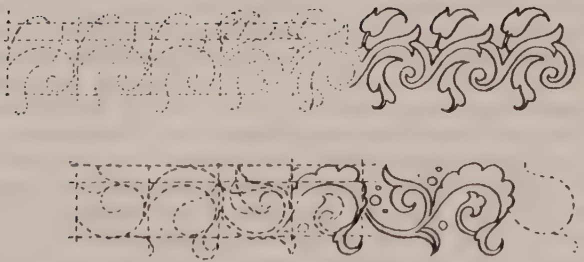
Fermentation is a change, a splitting up of matter with the formation of new products by living organisms called "ferments." Fermentation is the effect; these living organisms, called ferments, the cause. Observe also that there are many kinds of ferments, most of which would not be at all suitable for bread-making.

Fermentation is the name given to a class of decomposition undergone by a number of organic bodies in the presence of certain organised bodies of extreme minuteness termed ferments. All the kinds of fermentation at present known depend upon the existence and growth of minute organisms—these are the ferments; alcoholic fermentation is the change which sugar and other crystallisable substances undergo when subjected to the influences of a ferment such as yeast, whereby the sugar, etc., is converted into alcohol and carbonic acid gas.

There are also formed small quantities of succinic acid and glycerine; the yeast also uses a fraction of the sugar and the crystallisable substances to build up its own structure. It is also said that the fermentation takes place at the moment when the cells of yeast cease to have power to freely consume the materials of their nutrition by the absorption of free oxygen or common air, and continue to live by utilising matter containing oxygen, which, like sugar or such other unstable substances, break up and produce heat by their decomposition. The living organisms develop living force by taking it from the oxygen and transforming it, or from the sugar splitting it up and forming from it carbonic acid, alcohol, and other by-products.

In most minds the words putrefaction and fermentation are regarded as different and distinct from each other, but that is not so. Putrefaction is merely a form of fermentation. The change which produces carbonic acid gas from saccharine matter is termed fermentation. The change which produces sulphur compounds, etc., in decaying animal bodies, such as eggs, is called putrefaction; but the chemical operation of both is of the same kind, and consists of the resolution—the changing of complex bodies into simpler forms by organisms setting up

fermentation. *Bacterium lactis* is the ferment which makes lactic acid, *Micodermi vini* makes acetic acid, *Bacillus subtilis* makes butyric acid, *Bacterium termo* is the putrefactive ferment, etc., etc., and most of these fermentations are going on in well-fermented dough, when it becomes overripe and past maturity. The more the subject is investigated, whether as regards leavening or any other process of fermentation, the more clearly it will be established that the only true system of bread-making hinges on the principle of fermentation by means of pure sound yeast, and the quantity of that yeast must be governed by the style of work in hand.



Copy for Piping Practice.

RECIPES.

For Bread, Cakes, Flour Confectionery, and Sugar Confections.

THERE is a science in recipe-making, which, if understood, would enable persons having this knowledge to construct the proportions of ingredients to the making and the building up of every mixture, of every article of which the ingredients are capable of making up, without the necessity of having recourse to a separate recipe for every article.

If one ounce of sugar adds one degree of sweetness to four ounces of water, flour, fat, or eggs, then two ounces of sugar will add one degree of sweetness to eight ounces of either of these, or two degrees of sweetness to four ounces of either of them. If one ounce of fat added to four ounces of flour produces one degree of shortness, then two ounces added to the same quantity of flour will produce two degrees of shortness. If one ounce of egg, when added to four ounces each of flour, sugar, and fat, will aerate the mixture one degree, then two ounces of egg will aerate it two degrees.

Heat, when applied to any ingredient used by bakers, cooks, and confectioners, in its crude state, will have the same effect upon it, and quite independent of the quantity subjected to its influence. Flour will remain the same, in the shape of its mass, until it is calcined, and so will eggs. Fat and sugar will melt and flow out as a semi-liquid. When these are all mixed together, the action of heat upon them is the same, and whether the mixture rises upwards, flattens, or remains immobile depends entirely upon the varying proportions of the different ingredients and the method of incorporation.

The influence of liquidity as well as liquation upon a mixture is an important factor (a factor never to be neglected) in its preparation.

The disastrous results which follow upon "wetting the miller's eye" is well known, but his eye can be overmuch wetted in soup, jelly, cake, sweetmeat, biscuits, etc., as surely as in the dough for bread and pastry—water, or any ingredient containing water in varying proportions, always acts in the way assigned to it by Nature's law. It is always a solvent, and its action upon a mixture, under certain conditions, will be always the same; and

if these conditions are known and followed, certainty in result will displace the possibility of uncertainty in every case.

The correct quantity of each ingredient, and the mode of preparation of recipes for making up the various classes of goods usually on sale, is governed by the article to be made. For the convenience of those who are not sufficiently experienced in the profession, a comprehensive series of complete recipes for bread, cakes, flour, confectionery, and sugar confections follows, comprising cakes and biscuits, rich and plain pastry, "short" and "puff," soups, jellies, creams, ices, *petits fours*, Vienna bread, loaf bread, rolls, buns, scones, etc., etc.

Bread-making.

It is a moot question whether the cutting back, "heading up," turning over, handing up twice, is necessary, and does improve the texture of bread in all cases. This practice is not always necessary, and in some cases it may be harmful, for the following reasons. In very short processes the bread is more likely to be under than over aerated, and the gluten under rather than over degraded, and as manipulation during aeration must expel some of the gas, of which there is barely enough, and toughen the gluten which is then at the time too tough, it is obviously the reverse of good work to interfere with it. Further, as in these imperfect re-kneadings some of the parts of the dough will be pressed more firmly together than other parts, and these firmer parts taking necessarily more time to fully aerate than the looser parts, the result in the oven will be uneven expansion and uneven vesiculation.

Among the reasons which may render it necessary to re-knead a dough after its initial kneading are :

First—When it has been insufficiently kneaded in its first kneading, and is rough, coarse, and uneven in its parts. In this case, when it is about half-matured, it will improve not merely to turn it over, but to cut it back and thoroughly re-knead it.

Second—When a well-made dough is left to aerate in a place which is of a lower temperature than itself, the parts of the dough nearest or exposed to this lower temperature will yield up some of its heat to the surrounding atmosphere, and these parts will be less matured than the protected middle of the mass, and an occasional turning of the sides into the middle, or cutting back well to equalise the maturing of the whole.

Third—When a dough is exposed to an atmosphere warmer, and therefore drier, than itself, its outer surfaces this is especially the case with handed-up pieces—it yields up some of its moisture ; and these drier surfaces, when moulded into the loaf, do not

intimately blend with other parts, and the result—a coarser textured loaf. In this case it will be useful to turn fresh surfaces as often as possible by re-handing up, etc. But note carefully, whenever dough is re-manipulated during short or medium length processes, it is as near a physical certainty as it can be that some parts of it will receive heavier, firmer treatment than other parts; in quite 50 per cent. of manual-moulded loaves this is the case. When this is so, the parts so treated cannot be of the same degree in vesiculation as the other parts.

Fourth—When, by reason of the extreme length of time of some processes, the yeast and flour are tested severely, it is not only useful but necessary that the dough should be kept from fretting by frequent and very drastic manipulation. This will prevent the gluten, by stretching and spreading, from breaking, and becoming short and friable.

Fifth—When dough of any kind, for any reason, is fully ripe, and is in danger of losing its tenacity and spring, and becoming short and friable—this takes place in half the time with some sorts of flour more than with others—if left untouched in this state the bread made from it will break short, be of even texture, but will seldom be of full volume, and never spongy.

The Theory of Quick Fermentations and Straight Doughs.—To make this easy to understand, I will explain what are the uses of ferments and sponges. If you are a reader, and I hope you are, for if not I do not think that there is any hope for you. General reading clothes the mind of man, gives to the mental image the shades and colourings of the finished picture, and fills up the interstices of its framework, and warp and woof with the thinkings and knowings which make up its homogeneity. If you are such a reader, you will have read some of the many notices which have appeared about the ancient mode of bread-making—the pulverised grain of our remote ancestors, the leavened bread of the Hebrews, the fermented bread of the Greeks and Romans, and it must be plain to you that the ferment and sponge of to-day (or, may I say, of yesterday, for they are now going to their burial in the same tomb with leaven), is but an evolution in the growth of the knowledge about yeast, how it functions, reproduces, has its being, and dies. The abolition of these ferments and sponges will be but carrying on that evolution of the growth of the biological and botanical knowledge of the subject. For what are the uses of ferments and sponges? *The only use of a ferment is the provision of a soil in which to grow more yeast.* In the early days of the advent of yeast, it was so very much mixed with liquid that experience proved that ordinary quantities of this liquid contained insufficient power to aerate and lift the 280 lbs.

of flour; and after many trials, that by mixing a given quantity with some warm water, boiled potatoes and flour, or with scalded flour and a mash of malt, and letting these mixtures stand some hours, more power was obtained; and a stage further to mix some of this previously fermented mixture with more flour, and form it into a sponge, gave more power still. This result, which was obtained by constant practice, was not understood in its whys and wherefores; the theory of the practice was unknown, and by some is still unknown, and they must read what is said in the previous pages of this book about yeast. Here is a digest of it. Yeast is a living organism; food suitable to its healthy growth is found in flour or malt mash; when placed in liquid solution of this suitable food at a suitable temperature it breeds very fast, it doubles and doubles and doubles its numbers in rapid progressive fecundity. It contains within itself a digestive principle called Zymase, which acts precisely in the same way as the ptyalin of the human mouth, the diastase of malt and the cerealin in bran. These are digestive principles called unorganised ferments. Yeast, with the aid of this Zymase, digests the food it obtains from the flour, uses some of it (very little) for the purposes of building up its own structure, and some of it for respiratory oxygen; and then having used and changed its food, yeast gives off, respires, excretes as waste a gas called carbon dioxide and also alcohol. Naturally it follows that one cell, like one man, can only do the work of one cell, and live the life of one cell. And light bread is not the result of a ferment or a sponge, but of a sufficient number of yeast cells to do the work. Nor is the counting of them a difficult matter; it is as easy as to say one horse will draw a ton, and if I have a 10-ton load I shall want ten horses for it. We require 960 c.c.—by measure—of this gas to aerate every pound of flour in the batch, and if it is a one-sack batch we shall require 300,000 cells of yeast to aerate this batch with gas, and it will take them quite six hours' time to do it. In that time the first 300,000 will have quadrupled, and more—that is to say, it will take a million and more cells of yeast to raise one sack of flour in a given time, and therefore there is no question of ferment, sponge, or any other process, but simply a question of the quantity of yeast that is grown during the process, or put in at the beginning. To go back to that one horse and one ton. Suppose you have only one horse, and have ten tons of stuff to move one mile, what do you do? Why, move a ton at a time, and, of course, occupy the time of ten journeys instead of one. If you use Scotch flour, Parisian or compound barms, you have got a one-horse show, and you must give this one horse plenty of time in which to do the work, and the few yeast cells in these

barms will do it—they will breed enough other cells to do the work if you give them the necessary time in which to do it. You may say if this is so: Why bother about it; why not go on as we are? But wait a bit before you say it, for I reply, and without reservation, that *if there were no other* changes going on besides those effected by yeast, then 100 cells, given the time to multiply, will do as good work and as safely as 100,000 put in altogether; but there are conditions of change going on with which the yeast has little or nothing to do.

There are the hydrolysing agents, the enzymes, and diastasis at work. There are the putrefactive and the acid-making agents at work, for most if not all of these are present, especially in the more common sorts of flour. With the aid of the water, these enzymes are breaking down and changing the albuminoids, and the acid-making germs are present of a certainty in every dough, and it is only the addition of large doses of salt (read the uses of salt) in long processes which permits bread being even eatable, for all the beautiful aromatic and sugary flavour have either been destroyed or evaporated.

Do not say that long processes are necessary for certain yeasts, for that also is a mistake. Yeasts, like men, though of different sizes, strength, and degrees of health, all function alike; that is, they all digest their food alike.

The cell of yeast that is grown in a good wort for comp. and patent, or for a beer or for a spirit, is absolutely alike in its function of living and working, and in either case the size as well as the health and strength will depend upon the skill and care of the grower, farmer, brewer, call him what you like, and if he is a skilful gardener, then he knows the suitable soil for the sort of seed he plants.

There are weak, strong, and large and small cells grown in all the modes of making—yeast is yeast, and will do the work of yeast. And this answers the statement of some that yeast imparts flavour to bread. How can that be said of one yeast more than another, or of any? Yeast gas—CO_2—does not taste; the alcohol in bread does not, cannot taste, because there is not enough of it; and if they did impart taste to bread, to make these is characteristic of all yeasts, and the same with the work of its zymase. All yeasts are the same in construction, living, eating and working, and therefore the governing principles of straight off-hand dough bread making are those dictated by facts revealed to us by investigators who have given patient thought to this subject of yeast, and it is pressed upon the trade for trial because it will prevent the bad bread that is a reproach to bakers. It will save time, it will therefore save money.

It was this kind of bread that has won the prizes in three

consecutive exhibitions in open competition with the oldest and most experienced bakers.

The Seven Phases of Change in the Life of a Loaf of Bread.

If you have read the previous pages about yeast and straight-made doughs, you will have gathered that life is present, and the law of natural growth is at work. The life of a loaf of bread will be seen to be based upon the same principle as the growth and change in the life of human beings. If you mix 14 lbs. of flour, ¼ lb. yeast, 2 oz. of "Textis," 7 lbs. water, 110° F., and 2 ozs. salt together into a dough, and watch its passing phases in the evolution of its life, you will see first, say in five minutes, that there are signs of life—it is moving; take a piece and bake it, the bread will be close. It will have only a few vesicles in it, which shows that the yeast has only begun to work (assimilate its food); the vesicles or holes will be small bladders filled with gas and gluten expansion. That is the infancy. Let this dough stand another half hour, still watching it, and this infant life develops into the second stage—childhood. There is more life and movement, more vesicles; another half hour and its youth is reached; put a piece into the oven, and it bursts and breaks, and when baked it will be found full of gaps and holes, and much lighter. Up to this stage the dough has felt tough and leathery, but it now begins to get spongy and soft to the touch. Let it lie another hour and bake a piece, and if you have been careful to allow of free expansion after handling, it will burst and break still more than the last piece; but however you use the dough, the baked bread will be more full of vesicles, and much lighter. The dough will be more elastic and more resisting. This the manhood stage of the dough. In another hour examine the dough; its touch is soft and mellow, the resistance of its fibre is less; bake a piece, and as in the manhood stage, give the piece time to expand again after handling, and the baked bread will have a much finer vesiculation, the bread will break up easier in the mouth. It has reached the maturity stage. It has passed over the table of the mountain, and is on the descent into the valley on the other side. Examine the remaining dough; it begins to collapse when you grasp it, resistance is vanishing; bake a piece, it does not spring and jump as it did in youth and manhood, it does not move with the steady strength of maturity, its strength is declining. This is the age of decline and old age. In two more hours examine the dough, it is rotten to the touch; bake it, and it is nearly inert in the oven. This is the age of senile decay, corruption is in

rapid progress. Let the remaining piece be exposed to a moist atmosphere (throw it on to the potato or any other patch outside your door), then Nature will get back her own, for the molecular constitution will break up; the elements will be set at liberty, ready to build up new life again in plant or animal.

It will not matter in the least whether the dough is made high or low in temperament, much or little yeast is used, sponge or no sponge, these changes will occur; the only difference will be in the quickness of arriving at each stage.

This analogy is natural and correct. Examine the development in the life of human beings around, and you find that some at twenty years of age have the development of others at thirty, and some at forty-five look as old as men of sixty, while some at sixty look fresh, blithe, vigorous, and in their prime. The difference is that some have been made on the quick process principle and some on the slow, but both will have to pass or have passed through these adamantine governing principles of growth and development. Some people exert more energy—mental or physical—in one year than others do in three years, and consequently are ahead in development, though only the same age in years.

To particularise with Theoretical Science in detail after this generalising, and explain stage by stage the changes which take place in bread-making processes. The **Birth** of the loaf is the putting together of the raw materials. The loaf is begotten and begins to live; the yeast, with the help of the water, soluble matter and "Textis" present, makes its first meal, and begins work in earnest, and the infancy stage is reached, and the age of the birth of glucose (invert sugar $C_6H_{12}O_6$) and carbon dioxide (CO_2); the dough is alive and growing, but very crude. The yeast continuing its work changes more of the starch into this glucose sugar, and then eats, absorbs it into its own structure, and having digested it, excretes, as the waste from the meal, more CO_2. This is the childhood stage—growing, green, unripe. This is the age of the development of $C_6H_{12}O_6$ and CO_2. The yeast is now breeding and multiplying very fast, and is attacking and changing a much larger quantity of the starch. Its enzyme, digestive fluid, is also assuming a quantity sufficient to make itself felt upon the glutinous part of the flour, breaking some of it up into less complex compounds. This is the youth of the dough, strong, vigorous, resisting, growing. It is **the age** of the birth of the change of the proteid matter, the wholesale changing of the carbo-hydrates, the production of maltose ($C_{12}H_{22}O_{11}$), and the birth of alcohol (C_2H_5HO). At this stage there is actively at work upon the constituents of the dough, yeast, enzymes (the digesters), disease germs, the solving power of water and the

reaction of each upon the other, resulting in the breaking up of one compound and the formation of another. This is the *manhood stage* in the growth of the loaf. It is **the age** of the beginning of the change of proteid into peptone, the rapid formation of alcohol, the fructification of *Bacterium lactis*, and the beginning of the end of glucose.

This stage is ripe stage, the healthy stage, but it is not fully ripe and fully mature; it has reached the top of the hill of growth, and if baked now will be beautifully nice; but it may have a hole or two, it may spring out of shape, for it is full of life and strength. This is the bread of health. Let it stand and *decay* if you want perfect shape, for *the next stage is maturity*, and is on the very edge of the brow of the hill on the going-down side. It is **the age** of the end of glucose, and the beginning of the tasting presence of acid. Another stage down the hill, and *old age* succeeds it. *This is* **the age** of the fructification of *Mycoderma aceti*—the oxidation of the alcohol and the tissue units followed quickly by the *senile decay stage*, **the age** of the fructification of *Bacillus subtilis*, the breaking up and changing of molecular constitution, and the beginning of Nature getting back the elements which she had lent to make up the raw materials.

These changes take place in every kind of process-made dough, the one with a cycle which will be complete in 4 hours for manhood, 12 hours for decay, made with 2½ lbs. yeast, and heat 110° F. A cycle in 6 hours and 18, with 1½ lbs. yeast and 96° F.; a cycle in 8 hours and 24, with 1 lb. yeast, 86° F.; a cycle in 12 hours and 36, with 6 ozs. yeast and 70° F. The beginning of each cycle is birth, the end death, and the age of the reign of heat, water, air, and bacteria. All the cycles pass through the same stages—some faster, some slower, and by the same evolution of the natural law governing all organic life.

The Flavour of bread is not the result of the type or quantity of yeast, or of the kind of flour used. Different flavours in bread result from different degrees of heat, of fermentation, the length of time the yeast is allowed in which to alter the flour, and assimilate the products of the change, the different percentages of albuminoid matter in the flour, combined with the length of time such albuminoid matter is subject to hydration by water and degradation by the action of diastasis; by the different quantities of salt and "Textis" employed in its making, and by the different heats in baking chamber to which it is subjected.

There are two broad divisions of types of flavour in bread, one caused by excessive use of salt, and length of fermentation with a small quantity of yeast; and the other by the excessive heat and rapidity of the fermentation, excessive heat of the baking chamber, and the large quantity of yeast, and small quantity of salt.

"**Crumbliness**" is caused by overripeness, vigorous fermentation, excessive heat, or length of time in working, insufficiency of baking, and insufficiency of salt—these are the chief contributory causes. The kind of flour used has not much to do with it, and the other factors must all be present to obtain it. It occurs in this way. A plentiful quantity of vigorous yeast, with the stimulation of heat and plenty of food—perhaps from added sugar, potatoes, or yeast foods—has been allowed plenty of time in which to attack the starch, and change large quantities of it into other and simpler compounds; diastasis and hydrolysis have also been at work, and the result is a wholesome decomposition of the constituents of the flour, separating them into parts having no affinity with each other; and these being isolated, and albumen being practically absent, there is nothing to connect them; and the heat of fermentation commencing, and the heat of oven completing the evaporation of moisture—not all of it, of course, or the atoms would fall apart like sand—and the absorption of some more of the moisture by the atmosphere as it gets cold and stale, produces what the baker calls crumby bread. Buy and eat of this bread, oh, ye suffering dyspeptics, for it is already digested, and a very small percentage of acid is present; for it is the half-way house, at the end of Sweet Lane, and the beginning of Sour Street. The remedy for crumbliness is "Textis."

Harsh Flint-crusted Bread, on the other hand, is caused by the reverse of these conditions; the gluten undegraded, diastasis and hydrolysis have had no time or chance to work. The yeast, either deficient in quantity, health, or lack of time in working, has not helped the work of decomposition. The gluten, like thin sheets of gelatine, merely stretches and dries, and when cold, gives to the eater and handler a gum and hand-cutting crust, from which all bakers should devoutly pray to be delivered.

Dry Bread.—Well, both of these are very dry breads; and dry bread, according to the degree of dryness and character, oscillates like a pendulum always between these two—more of one and less of the other; less of one and more of the other.

Sour Bread, when due to fermentation, is caused by overripeness and not by uncleanness of either men or utensils, nor does it result from the use of bad materials. Extremes of temperature do not cause sourness; any system of fermentation, and any degree of heat, will cause it, if length of time is allowed sufficient for the purpose. Sour bread is caused by overfermentation, the result of the dough being allowed to work too long in the bread that is sour. Sour bread is caused by bad and ignorant workmanship, and by the exigencies of a commercial

business; it being sometimes difficult to do that which wisdom prompts, and which a scientific knowledge of the phenomena of fermentation points out at the time should be done. The operation by which sourness is called into existence is as follows: Yeast, by a peculiar property within itself—a ferment termed zymase—has the power, when brought into contact with flour, of converting a portion of the starch into glucose and maltose, thus effecting a chemical change, and producing a new chemical compound. Having changed some of the starch into these gummy saccharine matters, it next proceeds to separate them in its digestive apparatus into three elements—carbon, hydrogen, and oxygen—breathing out as excreta during the process gas called carbonic acid (carbon dioxide), and alcohol. At certain stages and under fixed principles a fermentation is set up by the organisms producing putrefaction. There is further going on within the sponge and dough the action of diastasis, the enzymes (the unorganised ferments), and also in the "order of nature" a development of decay in the yeast, and the usual accompaniment of decay, viz.: the work of microbes producing acids and putrefaction. These, in most cases, are simply symptoms and evidence of the senile decay.

There is a continuous onward change going on; and having united these great Nature's forces, they will go on with their work; and not only will acid-producing germs do their work, but putrefactive as well, until every atom in that sponge and dough is resolved into its ultimate elements and becomes again the gas, the acid, and the phosphate of the air and the field. Each of these changes is brought about by the action of some germ, but time does it. It is not more correct to say that they get in from the outside than to say that they are developed from inside, and only wait to be set free by processes of fermentation to begin to operate after their kind.

Ripeness of Dough.

Ripe, overripe, unripe, are all intermingling terms. A dough that would be overripe for 2-lb. loaves is only ripe for rolls; or one that would be just ripe enough for very crusty bread, baked in a hot oven, would be overripe for very crumby bread; and if this crumby bread happened to be put into a cool oven, it would probably develop a bad flavour. Therefore heat of oven and size of loaf are very important items to consider during the day's baking. Heat decomposes acids, and the acid of a ripe loaf is increased or decreased accordingly by different temperatures of oven, and the crust will always be sweeter than the crumb of a ripe loaf for that reason.

The Causes of Holes in Bread.

All bread will have more or less holes, and these will vary in size as well as in number according to the mode employed in the making. Holes in bread are the result, in the great majority of cases, of careless workmanship, sometimes from a backward, unripe dough, overripe dough, or over-manipulated dough.

Doughs made from different grades of flour, by different modes of working the fermentation, or from faulty flour and yeast, will have different degrees of physical strength, of the tissue of the flour, or the vigour of the yeast. When this is so, they will require different handling during the process of making up, light or heavy as the case may be.

The chief place in the process where the moulder increases or diminishes the number and size of the holes, and where his skill comes in most conspicuously, is at the oven, or where the loaf receives its final moulding.

If the loaf is to be taken from you and put into the oven at once, mould it with as few turns and as light and thoroughly as possible, but also leave the spring in it. If the loaf has to stand and prove before going into the oven, mould it clear and firm, but still leave some spring in it. Never mould and grind the loaf in moulding, or in mixer or divider, till its spring is gone, and its tissue is destroyed, and it is soft and dead; if you do, then there will be holes, and unskilful work has caused them. The expansion of unevenly distributed gas is seen to be the cause; also, when a part of the loaf next the wall of oven (the crusty side) is cut, it will be seen to have more and larger holes than the part not so much exposed, showing that heat has caused the expansion. One or two large holes in centre show that the tails of the closings are too large, too dry, and too hard, and could not expand as evenly or as easily as the other part of the loaf. This sort of hole is also caused by the heavy bash fixing the head on. If a workman knows his work, he will know as soon as he handles the loaf whether it is at liberty and ready or bound up. If it is bound up and has any life in it of either gas or gluten, it must burst out somewhere, and usually it is towards the top, because the heat can get full play upon it, the sides being more or less protected by the other loaves. Roughly classified, there are four kinds of holes: caused by insufficient change in dough; by too much change, and in that state subjected to rough grinding by the dividing machine; by being put into the oven with too much spring in it; and by clumsy, bad moulding.

Several Types of Bread, and How to Make Them.

I will now give a few processes for making a batch of bread of any one of the well-known standard kinds, which recipes will cover the ground from the lowest or weakest type of home-made bread fermentation up to the highest or excessive fermentation for well-piled bread. These recipes are in use in Ireland and Scotland as well as England.

EXAMPLES.

Farmhouse or "Home-made" Bread.

280 lbs. good white flour; 1¼ lbs. yeast; 1 lb. "Textis"; 2¼ lbs. salt; 56 quarts water. Set a ferment—at 84° to 90° F., according to the weather—with the "Textis" yeast, 16 lbs. flour, and about 20 quarts water; it will work from two to four hours. Directly this ferment is ready, strain it into the trough, with the remainder of the water and the salt (the water must be warm enough to make the dough about 80° to 90° when all the flour is in it), and make up very lightly into a light firm dough. Give this dough three hours in the trough, and then throw it out, scale off 2 lbs. 3 ozs. for the 2 lb. loaf, hand up the scaled pieces of dough with plenty of dust, and let it prove very much; when it is full proof mould it up lightly (dry with dust) with a very small top, turn the bottom upside down before you put the top on, so that when it is in the oven it will break open roughly; as soon as it is moulded put on the top, mark it with a stamp, and put at once into the oven. Of course, any sort of oven will do, but to be proper it should be put into an externally heated oven, with an iron plate for a bottom. The oven should have plenty of top heat and very little bottom.

Silken Piled Well-fermented Bread.

280 lbs. of flour, which should be about half soft roller "whites" or "supers," and half good strong flour; mix them well together in the trough, put the pin-board in, and make a bay large enough to stir a sponge with a third of the flour; be sure and press down the flour all round the back of the board to keep the liquor from escaping; mix 1 lb. "Textis" with 35 quarts of water hot enough to bring the sponge to 84° F. when the flour is in, carefully and thoroughly dissolve ¾ lb. of yeast into it, and ¼ lb. of salt. Stir into a stiff batter sponge, just firm enough to enable you to put your hands under it and flap it over. Do this several

times to make it tough, dust it a little, put some labour into it—either with sponge stirrer or arms, only do it well—and then leave it to ferment until it rises, breaks, and falls, which will be in about eight hours. As soon at it begins to subside pour into it 25 quarts of water—95° F.—and 3¾ lbs. salt, mix all together, and make into a nice clear dough with some spring in it. To get this spring and toughness put plenty of labour into it, cut it back, turn over, and knead well; let it prove two hours, and then, if ripe enough, throw out, scale off, and hand up firmly into boxes. Give these pieces fifteen minutes in the boxes, and if they are free and lively, mould into oven if for "packed" crumby bread; but if for crusty, mould and prove them in boxes before putting them into oven.

> *Note.*—In this example there should be enough salt to check and season the excessive fermentation, a good tough sponge to give the yeast plenty of work, and good glutinous flour, because it is the flour that makes the silken pile, not the workmanship.

Light, Crisp, Crusty Cottage Bread.

For 280 lbs. fine white flour, put in a ferment with 1 lb. "Textis," 2 lbs. flour, ¾ lb. yeast, and 20 quarts water at 86° F.; let this ferment be in the tub until it subsides, then strain into the trough with the pin-board in. Add 20 quarts more water at 84° to 90° F., and with about 56 lbs. of flour stir a batter "flying sponge"; let this "come up" once, which will be in about two hours. Then dissolve in 16 quarts warm water, 2 lbs. salt; stir this into sponge, and make a dry firm dough, which will be ready to come out of the trough in half an hour, and will usually prove quick enough to require following up—if the bakehouse be warm—as fast as the smartest of bakers can work. This dough should be baked in a sharp oven, and if light and well proved, 2-lb. loaves will, as a rule, bake in forty-five minutes from the time the oven door is shut.

> *Note particularly.*—No liberties must be taken with this dough by letting it lie about after the sponge is stirred, every stage should be watched and followed up quickly, and then you will have handsome bread of a delicious flavour—that is, if the flour is good. And further, if you have a large staff of helpers and plenty of oven room, this is a very desirable mode for pushing through a few score bushels nightly, without any waste of time.

Suitable for Small Bakers.

To make several kinds from one batch: 1 lb. yeast, 280 lbs. flour, 56 quarts water, 3½ lbs. salt, 1 lb. "Textis"; put in a sponge with 40 quarts water at 90° F., according to weather; put the pinboard into one end of the trough, to form a division large enough to hold this; having well fastened the board with flour, put the liquor into it, add the yeast carefully dissolved, and about a bushel of the flour. Stir into a batter sponge, and leave to ferment six to seven hours, or until it subsides, then dissolve 3½ lbs. salt in 16 quarts water, 96° F., mix up with the sponge. If you want a few French rolls, dip from this sponge into fine flour and make rather weak, or if a few tight dough, or small fancy, make tight. If you make only a few brown loaves, this sponge will be but a little thicker than a ferment, when all the water is in, and will make good brown bread if dipped into good meal. Vienna: to make nice, rub a little butter into fine Hungarian flour, dip enough of this thin sponge into it to make the quantity you require. The remaining portion of sponge should be made up and left to prove for half an hour, just time to get a cup of tea and a snack, then begin to weigh off and mould all that are to be baked with the batch. The few twists and rolls should be made up, and be baked after the batch bread comes out, because they must have a hot oven. Batch tea ("tough") cakes and all very small rolls baked upon tins must also be baked afterwards in warm oven. Of course, to make six or eight different sorts and sizes of bread off one ferment, and bake them all off before deterioration, will mean smartness and judgment; but there are scores of small bakers who have to do this, and they frequently make bread this way that would compare favourably with that made in the larger shops. If the rolls, etc., are baked off first, the doughs for them should be made as quickly as possible, covered up and kept warm. In moulding always get up the small bread first. In filling the oven put in the largest and closely packed bread first, these will take more time to bake. Twists, small rolls, etc., should be proved with steam. If you have no proving cupboard, put a pail of boiling water into the trough, fit sticks to the same, and put the rolls over the water.

Good Housekeeper's and Farmhouse Bread.

To make one peck of flour into bread: Put in the sponge when you are preparing to go to bed, with the following quantities: 2 quarts of warm water (not hot), teaspoonful of "Textis," about half of the flour, and 2 ozs. yeast; stir these into a sponge in a pan large enough to allow room to rise to double its initial

bulk, put this into a comfortable corner, with a stick across to keep the cloth out, cover up and leave until you get up. In about eight to twelve hours from the time the sponge was put in, make the dough, add another quart of warm water, 2 ozs. salt, well mix them, and make into a firm dough. In about an hour it will be ready to mould up for the oven; keep it warm.

Small Fancy Bread for the Stillroom Maids.

At bed-time, put in a sponge with one quart of half milk and half water (if the weather is cold) as warm as you can comfortably bear the back of your hand in, not quite 2 ozs. yeast, teaspoonful of "Textis," and enough fine flour (as good as the establishment contains, fine Hungarian if possible) to make it into a nice batter; stir well, and put into a comfortable corner to ferment until you get up. The pan must be quite a gallon size. As soon as you come down in the morning, weigh and powder 1 oz. salt and sprinkle over the top of the sponge; add half pint warm water; rub 2 ozs. good butter (fresh if you may use it) into enough flour, and make the sponge into a nice firm, smooth dough, cover this up to prove; if it has got cold you must warm it up carefully by putting it near the fire, but do not partially bake it. When it has risen, mould it into the rolls you require, well prove (rise) before baking, and bake in a nice hot oven. This will make almost any kinds of rolls for breakfast. Add sugar, or eggs, when preferred.

Vienna Bread—Baker's.

Quantities.—1 bushel fine Hungarian flour; ½ lb. "Textis"; 6 ozs. yeast; 4 ozs. salt; 12 quarts water. Stir a good sponge, but not tight or firm, with 8 quarts water, 90° F., yeast, and sufficient flour. Allow it to rise and subside, which will be in about four hours. Then dissolve the salt in three more quarts of warm water, break into the sponge, make a tough but not hard dough; give it a good proof in trough; it will move quickly when ready to throw out.

For crescents use 2 ozs. fresh butter and ½ oz. powdered loaf-sugar to the pound of dough, and 2 ozs. yeast to the quart; work in carefully, but do not make it too stiff. The queen's bread should have an egg added to this quantity of butter and sugar. The crescent, queen's, and twist dough will require to prove an hour or two longer than the Vienna dough. For dinner rolls break eight out of 1 lb. dough; penny rolls four out of 1 lb.; twopenny rolls, 10 ozs.; threepenny, 1 lb.; sixpenny, 2 lbs.; crescents and queen's, six or eight out of 1 lb., according to neighbourhood and credit.

Vienna Bread—Small Bakers and Hotels.

Quantities.—2 ozs. yeast; 1 quart water; 1 quart milk; 1 oz. "Textis"; 1 oz. salt; and 9 lbs. finest Hungarian flour. Put in a sponge, with the milk and water at 90° F., yeast, and flour to make a batter sponge. Let this rise and fall, and then make the dough. Powder the salt on to the sponge, and mix in with enough flour to make a light dough. It will be ready for moulding in an hour.

Best Cottage.

140 lbs. flour, the highest quality purchasable; $1\frac{1}{4}$ lbs. best yeast; 1 lb. 10 ozs. salt; $\frac{1}{2}$ lb. "Textis"; $62\frac{1}{2}$ lbs. of water (25 quarts), at a temperature high enough to ensure that the temperature of the dough, when finished making, shall not be less than 78° F.; place the yeast, "Textis," and a handful of flour in a vessel with 4 quarts water, temperature 80° F. Stir until the whole is mixed, then put the remainder of the water in the flour, placed ready in trough or mixer, add the salt, and dissolve it in the water, and then add to it the yeast mixture, and make the whole into a dough. Make a clear, well-made, homogeneous dough, cover up, and leave to aerate two hours, then look at it, and note its appearance. If it is rising evenly, smoothly, cover again, and allow it a further thirty to sixty minutes; but if, and when, the surface is cracking, the tissue of the flour is breaking up, this will be a physical sign that fermentation has proceeded far enough, and the dough has reached its maturity. When this stage is reached, place the dough upon the table, weigh off, "hand up," cover up, and allow it to aerate again for twenty minutes, then mould into loaves; let the loaves aerate again fifteen to thirty minutes, and then put them into an oven heated to a temperature high enough to ensure the proper baking.

Best "Batch" "Close-packed" "Crumby" Bread.

140 lbs. flour of the best possible quality; 1 lb. yeast; $\frac{1}{2}$ lb. "Textis"; 1 lb. 14 ozs. salt; $67\frac{1}{2}$ lbs. water (27 quarts); temperature of dough when made 76° to 78° F. Mix the yeast and a handful of flour with 4 quarts of the water at about 80° F., put the rest of the water into the flour, dissolve the salt in it, then pour in the yeast mixture, and make the whole up into dough. Let them aerate for four hours, table, weigh off, and hand up; leave to re-aerate twenty minutes, then mould, and put into an oven heated to a temperature that will bake the batch in one and a quarter hours.

Best Pan Bread.

140 lbs. flour, the best possible quality, 1¼ lbs. yeast, 1 lb. "Textis," 1 lb. 6 ozs. salt, 72½ lbs. (29 quarts) water. The temperature of the dough when made 84° F. Mix the yeast, "Textis," and a handful of flour in 4 quarts of the water at 80° F. Put the rest of the water into the flour, dissolve the salt in the water, then pour in the yeast mixture and mix the whole up into dough. Let aerate two hours, then table, weigh off, and hand up. Allow these handed-up pieces to re-aerate for ten minutes, and then mould into tins (pans). Let the loaves remain in the pans to rise until well risen, and then put them into an oven heated to a temperature that will bake them in forty-five minutes.

Questions on Temperatures.

Q. In these recipes mention is made of the temperature of the dough and the temperature of the oven, but the degree is not mentioned of either water or oven. What should be the exact temperature? The exact temperature of the resulting dough is stated, and also the exact number of hours the dough should stand to aerate. Will this be correct for summer and winter?

A. The exact degree in the temperature of the water is not given, because it must fluctuate with the fluctuations of the surrounding atmosphere, but these changes will not interfere with, or prevent, the dough being made to be of the exact degree of heat required at the time of making it. A simple rule, if practised, will ensure this. Add the number of the degrees of the flour to those of the water, and then divide the total into two equal parts. The number of this half part will, within a degree, be the number of the degree of the dough made up from the flour and water. If the temperature of the dough is to be 80° and the flour is 60°, then the heat of the water must be 100°. Six and ten, sixteen = 160°; the half of sixteen, eight = 80°; heat of the dough, 80°. The dough to be 78°, and the flour is 58°, the water must then be 98°, which, added together, is 156°; half of 156° is 78°. Any required heat of dough can be obtained in this way.

The number of hours the dough is to be left to aerate is stated, but in all cases it must be clearly understood that when a time limit is fixed to the duration of fermentation or of baking that such a time limit is only the nearest *approximate* time; the exact moment of time in either case will be governed by each individual batch and baking, and only during its identical making and baking. The varying character of flour, water, and yeast in different parts of the country and in different bakehouses makes anything nearer

than a close approximation impossible. This is where the experience of the baker must come in. The captain is left to guide his ship, though he is provided with a chart and compass to guide it by. Extremes of heat and cold in the weather may cause the baker to lengthen or shorten the time of aeration. To give to a degree the temperature of ovens for baking is even more difficult, and therefore an approximate heat is not attempted. There are a number of ovens without a heat-registering apparatus, and those that have register the heat in different scales. Some at 410° F. will bake a two-bag batch in forty-five minutes; others register 450° F. to 500° F. to bake the same quantity in that time. Another, and even more important, difference in the baking behaviour of ovens is the differing permanence of the heat in the oven. In the externally heated, the fire is always burning, and the heat absorbed by the ingoing batch is compensated for by a continuous supply of heat from the furnace, and the internal heat of the baking chamber is, within a few degrees, kept up while the bread is baking, but in the internally heated oven the fire has necessarily to be nearly or quite out, and must not be replenished with more fuel. The heat must therefore be higher at the putting in of the batch, because the amount absorbed by dough cannot be added or compensated for while the batch is in the oven. Another barrier to stating a baking heat as a law is the wide margin there is in the differing *colouring* properties of flours. The bread made from very white, low glutened flour will require quite 20° more heat to colour its crust artistically than a highly glutened coarse flour. The temperature at which the individual batch is to be baked must be left to "the man at the wheel."

Q. Why do you use the bag—weight 140 lbs.—as the base for building up quantities of flour in the bread-making recipes? Why not the 224 lbs. or the 280 lbs. sack? These weights are also freely used in many parts of the country.

A. All these differently weighted flour packages are in use, but it will not only be cumbrous, but very wasteful of time to the reader, and of space, to state quantities of recipes for each weight. Further, these weights are easily convertible one into the other, and more important, the one-sixteenth of a ton is easier for the baker to lift than one-tenth or one-eighth. There are agitations—chiefly on the part of carmen, carriers, and haulers, who have cranes and horses to help them—to make the one-eighth of a ton or the one-tenth parcel the universal weight because of the pennies they receive for delivering it; but if a universal unit of weight is, and should be, adopted, such unit of weight should be adapted to the chief user and handler of it, the baker, and not to the crane, ship, or rail car. Therefore, for these various

reasons, the unit of weight chosen as being the most convenient for bakers is the 140 lbs. bag, which is at present so popular.

Ordinary Commercial Batch Bread—Sponge Process.

Make a sponge with 60 lbs. flour; 35 lbs. (14 quarts) of water; ½ lb. yeast; and 8 ozs. "Textis"; temperature of sponge when made 82° F. Let this sponge work for six hours, then add to it 35 lbs. more water, 1¾ lbs. salt; break this all up into a smooth thin batter, and then add the remainder of the 140 lbs. flour (80 lbs.), and make the whole into a clear dough. The water should be of a temperature which will make the dough 78° to 80° when finished. Let this dough stand to aerate two hours, and then table, weigh off, hand up, and in a few minutes after handing up mould it up into loaves. If it is to be packed close, crumby, into the oven, put it into the oven direct from the moulder's hands. If it is to be baked in pans, allow the dough in the pan to freely aerate before being put in. If for crusty bread, not baked in pans, after moulding, allow to re-aerate before putting into the oven.

Highly Fermented Batch Bread.

140 lbs. flour, 72½ lbs. water (29 quarts), 6 ozs. yeast, ½ lb. "Textis," 2¼ lbs. salt, ½ lb. lard or good fat. Set a sponge with half of the water, the "Textis," 60 lbs. of flour, and 1 lb. salt. Temperature of the sponge when set, 74° F. Leave to ferment from ten to twelve hours, then add the remainder of the salt and water to the sponge, and well mix together; rub the fat into the remainder of the flour, add it to the sponge—make the whole into dough. Temperature 72° F to 74° F. and leave to aerate for two hours. Then take it out of the trough and pass it through the brake rolls; or, failing a brake, thoroughly knead it by folding and fisting, and leave to aerate another hour. Then table, weigh off, hand up, and in a few minutes mould into the shape required. This will make very good close-packed crumby batch bread. If to make crusty bread, the dough should be made a little firmer by leaving out 2 quarts of the water, and add 1 lb. "Textis."

To make up the dough right off without a sponge use the same quantities; rub the fat into the flour, dissolve the salt in the water, add the yeast, and make the whole into dough—which will require from ten to twelve hours to aerate. Then well knead it again, and weigh off, hand up, mould and bake.

Though the temperature is put at 74° F. as that at which it is best to keep the heat of these long processes, it is uncertain, being dependent upon the weather.

A Small Test Demonstration or Domestic Batch.

1 quart of milk and 1 quart water mixed together and heated to 96° F.—as warm as the back of the hand will comfortably bear—1½ ozs. powdered salt, 2 ozs. "Textis," 2 ozs. yeast, 4 ozs. good fat or butter; if for small rolls or pan bread, 9½ to 10 lbs. of flour; if for large and crusty loaves, 10½ lbs. of flour. Have ready a large bowl—greased inside. Rub the fat into the flour and put it into the bowl, add the salt and sugar, the milk and water, mix the yeast in the liquid, and with a wooden spoon or spatula mix the whole thoroughly into a dough quite clear from dry flour and dry scraps of dough. When made, cover up in the bowl and place in a warm place, not hot, merely comfortable to keep the dough from chilling. Leave to aerate two hours, then dust a board or table with flour, turn out the dough upon it and well knead it, dusting a little flour over it during the operation; put it back into the bowl for another hour, and then turn it out and weigh or divide into the required size, shape the pieces, and allow them to aerate again until quite light, and then carefully bake. The amateur and novice will ascertain when bread is baked enough by pressing a finger upon the softest part of hot bread; if an indentation remains it is *not* done; if the indentation springs back again as a squeezed sponge will do, it is cooked enough. The proper amount of aeration of the shaped bread, before being put into the oven, is arrived at when the piece of dough has risen half to double its size after shaping; but a soft dough does not require to rise so much as a stiff dough before going into the oven, because being soft it contains more moisture, and while this moisture is getting warm in the oven the dough continues to rise a longer time than a stiff dough. Some kinds of flour, under precisely the same conditions, will take more time to ripen, mature, when in the dough stage than other kinds. Two points to guide learners: If the dough is rising quite smoothly on its surface, it has not arrived at its full state of maturity; but if its surface shows fissures, is cracking and rough, or a piece picked, comes off very short without effort, and does not stretch but breaks very easily, then the gluten of the flour is beginning to degrade, is ripe enough to be shaped up ready for baking.

Wholemeal Bread.

Use to every quart of water 1 oz. of yeast, 1 oz. "Textis," ¾ oz. salt, and 4 lbs. of meal. Mix all together into a dough, and leave to aerate two hours. It will then be ready for shaping into loaves for baking. Wholemeal dough should be made as soft as it can be handled comfortably. If the dough is firm the bread

will be unpalatably dry and coarse. The bran of meal is dry, and therefore absorbs moisture freely. If the meal has been made from good, strong, well-matured wheat—and it should be—$3\frac{3}{4}$ to 4 lbs. will be a sufficient quantity to use to 1 quart ($2\frac{1}{2}$ lbs.) of water. The temperature of the water should be between 90° and 100° F.

Q. Why is wheat-meal now called wholemeal?

A. Prior to the abolition of the corn laws, in the days of dear bread, a goodly proportion of the people's bread was made up from a mixture of the cheaper cereals and wheat. Wheat became cheap; these coarser breads gave place to bread made up from white wheaten flour. There was still a limited demand for a bread made from meal, and this was called brown bread, to separate it as a class from white bread. The small demand for brown bread paved the way for its neglect in the milling of the meal, only the very poorest of wheats being milled for brown meal, with sometimes an addition of other cereals, and the making of the bread, which was sometimes only a mixture of bran and inferior flour, very carelessly carried on, and for these reasons brown bread was all but ignored as a breadstuff by the people. The increasing demand for very white bread excited the attention of the domestic economist, dietetic specialist, and the medical man to the waste of good food by the non-user of the coarse parts of the wheat berry, improperly balanced diet, and the unequal decay in the parts of the human frame; and owing to the agitation set up, the people have been educated again in the creation of an appetite for wheat-meal bread, but it must be made from the whole of the wheat, nothing to be added nor taken away; it must be the whole of the meal, and nothing but the meal from wheat; and further, this wholemeal must be made from *the best, not the worst, wheat*—from a sound, highly-glutened wheat, and not from an unsound, weak, starchy wheat. The meal should be finely ground, so that the fibrous parts may be the more easily digested and assimilated.

When wholemeal bread is prepared from such a meal, and made properly, it is not only a useful foodstuff, but it is appetising and nice to eat.

Vienna Bread and Rolls.

In the beginning of the second half of the nineteenth century the name Vienna bread was applied to bread made in Austria for the tables of the rich and great. It was compounded of milk, water, butter, sugar, salt, yeast, and a very fine quality of flour—a flour of such excellence that no other country in Europe could equal it. The bread was made up into many shapes, very fanciful

in configuration, and baked in steam, the oven being specially constructed to retain as much as possible of the steam injected into it or generated in it. The bread was very crisp and crusty all round. In the early days of the steam engine and expeditious travel, travellers brought to England such glowing accounts of this beautiful bread that some of the craft were incited to go to Vienna to see how it was made. They went, they saw, and the spirit of enterprise grew so mightily upon them that they brought back, not only the beautiful flour, but the oven and the baker. The high price of Vienna flour—in 1870 80s. to 90s. per sack of 280 lbs.—and the open ports admitting wheat from all parts of the world, together with the important improvements in milling machinery, and the incitement of the spirit of emulation in British and American millers, has placed upon the markets of the world a flour which equals, if it does not excel, this special Austrian flour, with the result that the term Vienna bread is now merely a generic name for bread and rolls made and baked in a certain manner, and is to be obtained in every considerable town, not only in the United Kingdom, but in every civilised country.

Add to every 56 lbs. of the best quality of flour obtainable, ½ lb. of yeast, 1 lb. good fat, ½ lb. "Textis," ½ lb. salt, and 28 lbs. to 30 lbs.—according to dryness of flour—of water at 100° F. Rub the fat into the flour, mix the yeast liquid and "Textis," powder the salt into the flour, and then knead the whole into a smooth clear dough, and leave it to aerate from five to eight hours. The exact length of time is dependent upon the vitality of the yeast, the hardness or stability of the flour, and the temperature of the surrounding atmosphere. When freely aerated, knead again, place on table, weigh off into weight required, hand up the pieces, allow a minute or two to recover, and then shape ready for baking. Allow these shapes to aerate until light enough, and then place them into an oven at a fairly high temperature, and which at the moment of putting in the bread dough either full of, or being filled with, "live" wet steam, not superheated vapour. Subject the bread to the heat of the oven until the outer surface of it is an artistic light brown, and crisp and dry.

The fancy shapes should be made from a stiffer dough than plain rolls, and from a very freely aerated and ripe dough, so that the shape is retained during rising and baking. Add 1 lb. sweet fat to this mixture for these rolls. Any sort of rolls can be made from this mixture, and will be suitable for use at any meal; but for eating with tea or coffee, portions of the dough can be enriched by the addition of more butter and sugar, and when necessary eggs. These additions merely make types of rolls to suit types of palates, but do not in any way affect types of fermentation. Get this right, and then work into the dough

anything required by the eater, and then aerate well, shape prettily and bake nicely.

Q. Varying quantities of salt are given in the different recipes for the same quantities of flour. Why?

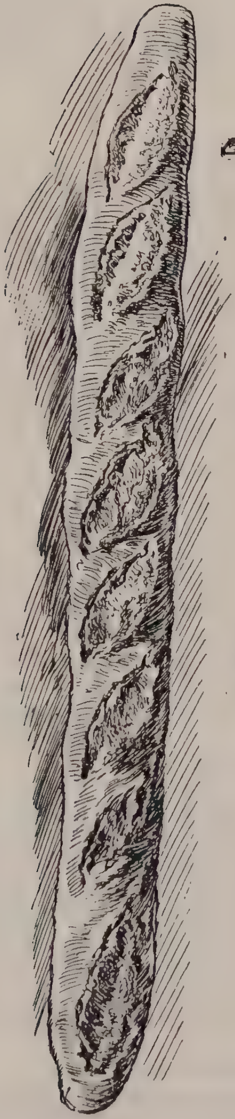
A. Salt, though chiefly used with food as a seasoner, is by its nature a preserver; it hardens the tissue, and preserves from degradation and decay animal and vegetable substances. In the short, simple processes of bread-making it is only used as a seasoner, and then 1 to 1¼ lbs. per bag of 140 lbs. of flour suffices; but in the long maturing processes its use is also to preserve the tissue of the flour from degrading too soon before the fermentation is complete, and for this purpose 4 to 5 lbs. is required.

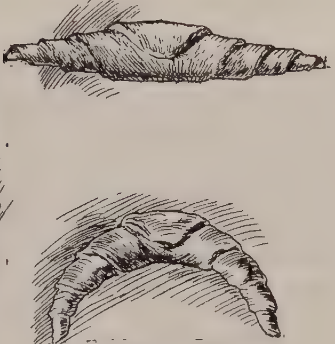
Q. Varying quantities of yeast are stated as necessary to aerate the same quantities of flour. Why?

A. A single yeast cell or a pound of yeast cells, in any given time, can only make the quantity of gas of the one cell or the one pound of cells in that given time. Yeast when sown in a suitable soil, such as a flour solution, not only assimilates the parts suitable for its nutrition, and then giving off as waste that which aerates the dough, it also reproduces itself in the production of young. And therefore if the process of bread-making is very protracted, the quantity of the yeast at the beginning is less than the quantity required in the shorter and less protracted processes. There is, too, the changing of the constituents of the flour by the yeast, and the longer the time the yeast is allowed to function in a given quantity of flour, the less quantity of yeast will be required to effect the necessary change of the constituents of the flour, because of its own reproduction (increase by breeding).

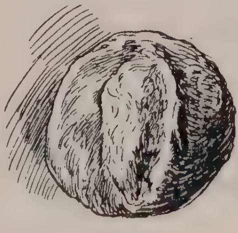
VIENNA BREAD SHAPES.

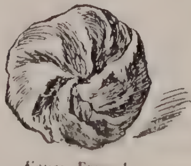
Crescents or Kipfels, Vienna Kipfels. The *Milch Kipfel* is made from ordinary Vienna dough and baked as crescents. The *Saltz Kipfel*: Shape up from Vienna dough, wash over with milk, and dip them in coarse table salt and caraway seeds; tin and bake as the others. *Lutter Struyzel* are made and baked as Vienna bread. *Mohn Struyzel:* Make two long cords or rolls, as for ordinary rolls; lay them across each other in the centre, there will then be four ends; plait all four; put on tins and prove, wash with milk, cover with poppy seeds (Mohn); bake as usual. The *Kaiser Semmel* is made from Vienna dough proved and baked as usual. The shaping of them is rather difficult. We have adopted a new and quicker way of shaping in London. Ordinary round rolls are cut, not straight across, but from the





2. Crescents or Kipfels,





Kaiser Semmel.

centre five times, of equal distance. The German mode: Take the roll, flatten it, and fold a fifth of the outer part over towards the centre and following each other, striking each fold to keep it in its place when baked. The fifth and last fold should be pushed neatly under the first fold, forming a star or rosette.

Crescents

are also made from Vienna flour. The operator proceeds as for Vienna rolls, but when the sponge is ready, *works into each lb. of dough 1 oz. more butter, and a teaspoonful of white sugar. This dough must be made much firmer than the former, on account of the shaping.* It is covered up, and put aside for about an hour, and is then ready for moulding. Weigh off into pieces of about 2 ozs., and roll out to about the size of small cheese-plates, keeping them constantly *covered with a slightly damped cloth* as far as possible throughout the moulding. This is very essential in all fancy breads, as it preserves what is called the "bloom," which is caused by a moist surface engaging more of the oven heat than a dry surface. The round piece of dough is now pulled slightly out to an oval shape, then one of the narrow ends is taken on the thumb, and rolled or folded outwards, care to be taken that the centre is pressed with the two forefingers as you proceed, pushing them from you; the shape would otherwise be too bulky in the middle (fig. 1). Now press the ends downwards into crescent or horse-shoe form (fig. 2); place them upon a baking-sheet or flat tin; put aside to prove or rise for half an hour, then lightly touch with milk, as for the Vienna rolls; bake in a "sound" oven, and, if possible, put into plenty of steam. If care is taken in the shaping and proving, a pretty and appetising breakfast roll will be the result.

Queen's Bread.

The sponge and the dough of Queen's bread are similar to that of the crescents, with this exception—that an egg is added (the quantity of 8 lbs. of flour being still retained as the basis). The dough is also worked firm as before, for making into shape. Weigh into 2 oz. pieces, make into balls, and, after allowing to stand for about five minutes, roll into lengths of, say, 8 inches, under the palms of the hands. Then shape into knots, twists, S's, etc. They admit of a variety of shapes, according to taste, and must be proved, washed, and baked as crescents.

Scooped-out Rolls.

are designed for the reception of potted meats, and are made from the same dough as crescents, but *without sugar.* They are weighed in 1 and 2 oz. pieces, and moulded egg shape. The part

that forms the closing or join of the roll is placed upon the tin, to preserve the shape. They should be well proven and well baked. The bottom is then carefully sliced off, and the inside cleanly scooped out and filled with mince or potted meats, and the bottom or lid re-fastened upon it with white of egg.

Sandwich Rolls.

may be made of the same dough. Take a piece, and roll out very thin (to about the eighth of an inch); cut it into halves; dust the space between with rice or fine flour. Lay one piece upon the other, put upon tins, and cut them through to the size required, but without disturbing the whole; then put aside to prove. Wash with milk as before, and bake in a sharp oven. When cold, the squares are parted from each other, and then the halves or layers are easily separated. Spread with potted ham, etc., to taste, and put together again.

"Brioche": a Rich French Bread.

1. Prepare mixture as follows: ½ pint milk; ¾ lb. butter; 1 oz. sugar; ½ oz. salt; 6 eggs; 2 ozs. yeast; and about 2½ lbs. fine Hungarian flour. Make the milk warm, mix with it the sugar, yeast, and a tablespoonful of flour; set this to ferment for an hour, then break the eggs into it, powder the salt, and rub the butter roughly with flour, and well knead the whole mixture into a smooth, firm dough. Put this dough away to prove for two or three hours, then knead it up again, and weigh into pieces of 2 ozs. each; mould into cottage-shaped loaves, with a very small top, place upon tins to rise, and bake a rich yellow colour. Before and after baking wash over with egg.

2. There is another brioche, for kitchen use, prepared as follows: Mix half the above quantity of sugar and milk with the yeast, and ½ lb. flour, and ferment as above; then rub the butter with the powdered salt, add the eggs and about 1 lb. of flour, and knead the whole mixture into a firm, smooth dough; spread it out upon the board, and lightly dust with flour; knead it, and put away to prove for four hours or more, to suit convenience in making up. To lie all night will not harm, but rather improve it. When well risen, knead it up, and it will then be ready for use. It should be moulded in one loaf, same shape as the smaller ones, notched round the side, and put into a cake-tin to prove for half an hour; wash over with egg, and bake in a moderate oven. This *brioche* paste or dough can be used for ornamental shapes, or to encase fruits, preserves, etc.

Vienna Rolls for Hotels, etc.

The following recipe may be relied upon to produce a satisfactory result. About 8 lbs. Vienna flour will be a convenient quantity to work up. For this, 3 ozs. fresh yeast will be required, 2 ozs. good butter, with 2 ozs. each of salt and white sugar, and 2 ozs. "Textis" will be a great improvement. Place 2 quarts water and ½ pint milk, warmed to blood heat—or 90° F.—in a large bowl or pan, which should be free from grease, and mix into it the yeast, the "Textis," the sugar, and about 1 lb. of the flour. Put away this sponge in a warm place to ferment for about three hours. When it settles down, or "drops," it is ready, but may stand another hour or two, if necessary, without damage. The powdered salt is now mixed into the sponge; the butter is taken and carefully rubbed into the remainder of the flour, which is then mixed with the sponge, and the dough is to be made soft; flour may be added if necessary, but with care. It is now put away to prove for another hour; then lightly folded together, using a little flour or ground rice to keep it from adhering to the board and hands. Weigh into pieces of ¼ lb., ½ lb., or 1 lb.—the usual size for these rolls; make them round, cover up for a few minutes that elasticity may be restored, then mould them into oval or egg shape, the larger ones to be made into long rolls with pointed ends, which is done by folding over and over inwards towards the moulder, pressing with both thumbs on the centre of the dough, until the ends are gradually worked out to the requisite length of 3, 6, or 12 inches respectively. They should be put away in a drawer or cupboard to "prove," or rise, for half an hour, and are then ready for the oven. It is usual, before putting them into the oven, to cut or score the top three or four times slantwise (see engraving, p. 80), and, if washed over with a little milk, a fine golden hue will be imparted. They should be placed upon the bottom; if not, use a baking-sheet or tin; but the oven must be of a good heat, though not rash or scorching. These rolls must be baked crisp.

The Vienna roll dough will also make excellent French rolls and tin bread for sandwiches and toast. These are to be well proved in tins made for the purpose, and baked crisp in a sharp oven. The French rolls are rasped.

To make Six Bushels of Bread with Brewer's Thick or Compressed Yeast.

Set the ferment as follows: Boil and mash 14 lbs. potatoes, or use ½ lb. "Textis"; add 4 quarts water, and strain into a tub; when

strained, test the heat with a thermometer, and use hot or cold water to make the whole about 90° F.; well mix into this 1 lb. flour; and then pour in 1 quart yeast or 1 lb. compressed brewer's yeast (dissolved), stirring it round once or twice; cover up the tub, and allow to ferment five or six hours. The ferment must not be moved or shaken until it is ready—that is, until fermentation has begun to subside, and the ferment is going or has gone down. When ready, add 7 gallons water (heat 86° F. when flour is in), strain into the trough, and mix into it enough flour to make into a tough, dry batter; pin this up into one end of the trough; let this sponge rise and fall, or incline downwards, twice—usually it will take about six hours; when the sponge is ready, dissolve 3¾ lbs. salt in 7 gallons water (80°); pour this into the sponge, and mix all together, breaking the sponge smooth with the salt liquor, then make into a stiff dough, quite clear from scraps and dry flour; give it plenty of labour to bring out the gluten; allow the dough to ferment until it is full of gas, then cut into pieces, dust lightly with flour, knead and fold it well together, throw it out of the trough, weigh off, hand up, mould into loaves, prove, and bake in a good "sound" oven.

To make Six Bushels with Dried Yeast without Potatoes.

58 quarts water, 280 lbs. good flour, 2½ lbs. salt, ¾ lbs. yeast, 1 lb. "Textis." Put in a sponge with half the water, yeast (dissolved), sugar, and enough flour to make a sponge, about 84° F; and let this lie about eight hours, until it rises and subsides. When it begins to go down, dissolve the salt in the remaining water (warm), and make a good dry dough; prove two hours, then throw out. Scale off and let it prove a little, and then mould. These alterations are necessary because of the improved quality of the yeast now, and potatoes to assist further growth of yeast is unnecessary.

Cookie Rolls are made by taking a piece of the sponge off (when ready) before the salt and water are added, and then rubbing into it sugar and butter or some other fat.

For No. 1, called **Plain Biscuit,** add to each pound of sponge 2 ozs. fat, 1 oz. of sugar, and dry up into dough with soft white flour. Let prove two to three hours; weigh off 2 ozs. for ½d., roll out like the ordinary batch or coffee-shop tea-cakes, and prove well in boxes. When ready for oven, put upon tins, and then dock in middle with a small docker, and bake.

No. 2, **Plain or Currant Cookies**: 1½ ozs. fat, 1½ ozs. sugar; rub in, and dry up into soft dough (like ordinary bun

dough). Prove three hours, scale 2 ozs. for ½d.; roll round, flatten to about 4 ins.; place upon tins, put a bow of short-paste upon top; prove in steam-press very light, and bake lightly like a bun. Before putting on the paste, wash with a mixture of egg and milk. This round roll, also notched as a star from centre to side, like the old Scotch bun, washed over, proved and baked, is also a nice cookie, and if a few currants are mixed into this, so much the better for a change.

No. 3, the **Hand Roll,** is made the same as for No. 4 dough, but moulded and rolled oval and flat, and then cut five times one end to represent fingers, washed over, proved well in press (upon tins), and baked as for buns.

No. 4, the **Victoria Roll**: 1 oz. fat to 1 lb. sponge, rub in, and let lie three hours; weigh 2 ozs. for ½d., pin out the piece oval to about 4 ins. in length, then fold over one end to make a half-circle turnover. Put upon a tin, wash over, prove well, and bake as a bun. This roll, when nicely made, looks very well; it rises in the oven like an oval puff, and is light and nice; in fact, they are a really fine, big, good-looking halfpennyworth, and cannot fail to sell well. Try them.

Blandy's Fancy Tea Bread.

Make a sponge with ½ lb. sugar, 1 lb. flour, 2 ozs. yeast, 2 ozs. "Textis," 1½ pints milk (90°); when it subsides add ½ lb. warm butter, 2 lbs. flour, and 3 eggs; make dough, and allow to rise one hour; then make into 2-oz. size a number of fancy shapes, prove, wash over carefully with yolk of egg, and bake in a sound oven.

There are several kinds of these cookies and bread which English, Welsh, and Irish will find it commercially useful to imitate. London, Dublin, and other large towns will find a ready sale for the halfpenny cookies. The Scotch pan and plain bread is very much superior in fineness of texture and volume to that of English and Welsh towns, though Ireland has not much to learn in this matter of fineness and bulk, perhaps rather, like Scotland, just a little to unlearn, and for this reason their mode of making is not reproduced here: it is so wasteful of time, of labour, and of nett profit. Nor is the temperature of the water given. It is dangerous to do so; it is the base of all, but it is a base that can only be laid down in the identical spot. The strength and temperature of the flour, and heat of atmosphere inside and outside, are factors which must be known before doing so.

The formula for plain, pan, and "French" here given is designed to meet the needs of those who sponge or make dough

overnight for use in the morning; and to those who have read the articles upon straight doughs, the seven phases in the life of a loaf, and yeast functioning herein, it will be apparent that the twelve hours in the dough stage is not arbitrary to the process, but can be quite safely reduced to six or eight hours. For those who find that time more convenient by an increase of heat and yeast, it will be only necessary to point out to the practical workman that this straight-made dough is merely a tight sponge with more salt than usual in it, and the temperature, if it is increased about 5° over that of the sponges they are in the habit of stirring at any time of the year, the results will be near enough to guide them to success after a trial or two. It will be noted by Scotchmen that the quantities given are the same for French, pan, and plain. The reason for this is that it does not appear necessary in breads of the same type in volume and texture to have different processes in making up. Scotchmen themselves do not make their French of equal firmness, but weaker or firmer to their own taste. The only difference necessary is not in the quantities but in the qualities of the flour used, and the addition of lard to the French.

To make Six Bushels with any of the Flour Barms on the Scotch System.

Use 8 quarts barm, 60 quarts water, half sack of soft mellow roller supers, and half sack good patent process middlings, mixed together, and 4½ lbs. salt. These quantities are the same for *half* or *quarter sponging*.

Half-Sponge.—Stir a stiff sponge with half the water at about 84° F., the barm, 1½ lbs. salt, and sufficient flour for the purpose. This should have about twelve hours to ferment, then break into it the other water, in which 3 lbs. salt have been dissolved, and make a weak dough; let this prove until full of gas and it breaks short; then throw out, scale off, mould, prove, and bake; or if for crumby packed bread, put into the oven direct from the moulder's hands. Brush the sides and ends with melted lard.

Quarter-Sponge.—Stir stiff butter in a tub with 8 quarts barm, 12 quarts warm water, 1 lb. salt, and sufficient flour; this will be ready in about ten hours. Then break into this 40 more quarts water and 2 lbs. salt; turn it into the trough and make a nice springy sponge; this will be in three or four hours. When it begins to subside mix in 6 more quarts water, and 1½ lbs. salt, and make into a tough, light dough, using plenty of labour.

Watch this dough—if the weather is warm it will fly; don't let it get ahead; follow it up quickly.

> *Note.*—In working with flour barms you have already generated a good body of yeast and gas in the barm, therefore use plenty of salt in the later stages. The sponges are the most particular part. Stir tough, not hard and tight, but spongy sponges, a stiff batter that will bear your arms to take some up without breaking. Join your hands together under the batter, and flap it over and mark it across two or three times, dry-dusting every time. It is now becoming customary to use a little distiller's compressed in the last stage of the process, which points to the early substitution of distiller's compressed in the place of Parisian. If it is found useful to use a little to help the Parisian, why not use it altogether, and let the risky, troublesome Parisian go entirely.

Formula.—Make up a straight dough with 280 lbs. of flour (quality to suit price and kind), 1 lb. "Textis," 1 lb. distiller's yeast, 4½ lbs. salt, 60 quarts of water (15 gallons of 10 lbs. each), and, if for French or pan bread, 1½ lbs. of melted butter or lard. Separate the yeast in a little of the water with the "Textis," dissolve the salt in the other water, and then make the whole up into a clear dough. Cover up and leave to ferment for twelve hours; then dry, dust, and knead well, and throw out of trough. Scale off, hand up, give it time to recover, and then mould into the shapes required.

Mould the loaf into a compact roll of about 10 inches in length, pass the grease brush round them, and then place upon a baking sheet quite closely. Upset them all round to keep in shape. Prove well, and bake.

THE LENGTH OF TIME, AND OF THE DEGREE OF TEMPERATURE OF WORKING THE PROCESSES, AND OF THE OVEN.

It will be noticed in some places I have put a very wide margin between the extremes of heat, 70° to 90° F. The reason for this is in the great difficulty there is in ascertaining the heat of the bakehouse and flour where the heats have to be applied. Climatic changes have to be accounted for, and also the length of time before being put into oven.

Further questions to be asked and answered would be: Where is the flour stored—in a loft over the bakehouse or in an outhouse? How many degrees of heat will the flour take from the

warm water when it is mixed with it? Is the bakehouse cold and airy, or close and warm? Does the biscuit-baker follow the bread-baker, and leave, as the natural result of his day's work, everything quite hot? By this it will be seen that the worker, to be safe, must learn to depend upon the experience gained in actual work. He should also have a thermometer to test his liquor, likewise a thermometer in the form of a round glass tube, or a metal cased one to put into the flour, sponge, and dough. The actual state of the weather outside has only a partial effect when the baking operation of any sort goes on nearly the whole round of the clock. Sometimes the flour is stored in the bakehouse or over the oven, and is always warm and dry; or, *vice versâ*, it may be stored in an outhouse and be nearly frozen—in this case, what an influence it will exert in determining temperature! Many other things will come to your remembrance if you think; I merely mention these to show how unwise it would be to trust too much to figures in a book, if it attempts to establish hard-and-fast rules. The heat to be obtained and maintained after the flour is in should be governed by the length of time it has to stand.

The time required for a ferment or sponge will be in proportion to the heat employed and quantity of yeast and yeast food used; for every increase in heat, or the quantity of yeast, will give a corresponding increase to the speed at which the sponge and ferment will work; the quality of the flour also will make a difference—a poor flour that is deficient in gluten will work quickly, the yeast will soon exhaust it and stop working; and, *vice versâ*, a strong, good flour will offer great resistance before degradation sufficient to make moist bread sets in; and, of course, the strength and freshness of the yeast will materially alter the length of time required. A half-dead or faint yeast will drag on very slowly indeed.

The time required for the dough to be ready will depend upon the change of volume of gas that has been developed in the earlier stages of ferment and sponge, and the quantity of salt used. If the sponge has been "worked" warm, and allowed to stand many hours, and a very strong gas thus generated, only sufficient time will be required to allow this gas to permeate the dough—say about half an hour; but if made from thick or patent yeast, and seasoned with a full quantity of salt, then one or two hours will not be too much. The time allowed for the dough must also be governed by the sort of bread that is required, as we have shown elsewhere in the various recipes for bread-making.

The time required for moulded rolls or loaves to rise will be governed by the firmness and life of the dough and loaves when moulded. If the dough is warm and full of life, 2-lb. and 4-lb.

loaves will be ready in a few minutes, and small bread in about half an hour. A warm, moist atmosphere will cause dough to "prove" very quickly; a dry, cold air has an opposite effect, and retards the rising.

The time required for baking bread depends upon the size of the loaf, the heat of the oven, upon the lightness and ripeness of the dough; and if only a small quantity of salt has been used, then the dough will be light and dry, and will bake very quickly; but if the gas has been developed slowly by a long process of fermentation, with only a small quantity of yeast to start it, and plenty of salt to "steady" it, then the flour, etc., being in an advanced stage of chemical transition or decomposition, will render the dough moist and bulky, and it will, as a consequence, require considerable baking.

The preceding remarks may be summed up as follows: A brewer's yeast ferment should be worked at 80°, and, when *healthy*, will take from four to six hours. The sponge worked at 80° (in temperate weather) will "drop" first time in about four hours, the second "fall" will take from one to two hours, and the dough, if made up at 80°, will take from one and a half to two hours.

A patent (compo or store) yeast ferment should be worked at 80°, and will take from six to nine hours; the sponge at 80°, from four to five hours; the dough at 80° from one to two hours.

A French or German yeast ferment worked at 90° will take two to three hours; a sponge at 90° (following after the ferment), two hours; if the sponge is worked without a ferment it will take four to sixteen hours, dependent upon quantity of yeast and heat. The dough made from a sponge that has succeeded a ferment will require only a few minutes before being "scaled off"; but if the dough is made from a sponge without a ferment, then it will require two hours, the moulded loaves ten minutes, and the rolls half an hour. If made from a ferment without a sponge it will require four to six hours, and depend upon the quantity of yeast used.

The time required for baking bread will vary, as we have said, according to the size of the loaf, the condition of fermentation when it was moulded, and the heat of the oven. 2-lb. loaves will bake in about forty-five minutes, sixty minutes, to one hour and a half. A certain sort of loaf, put into the oven without touching—"set crusty," as a baker would say—the oven being also rather hot, would be well baked in forty-five minutes; a large oven, well filled with cottage bread, that had been well fermented, and which, if not actually "set crumby," would be close together; and in this case one hour would not be too much. Some shops are placed in the midst of a settled, working-class population,

whose customers' requirements are very regular; and therefore, day by day, the oven, that most likely has been allowed to lie down, will be filled with the same quantity of batch bread, "crumby bricks," and cottages; and then one hour and a half would be required to bake it. A little light here will be sufficient to show that the whole matter lies in a very small compass.

The point at which cooking commences is reached as soon as the article is heated to 212°, and the speed at which it will be cooked or baked will depend upon the amount of surface exposed to the heat. A baker's oven is usually heated up to 400° or 500° when designed for baking a batch of bread; if the loaves are placed in this oven, say an inch apart, then each loaf will have a certain number of cubic inches of heat all to itself, and will present to that heat a large amount of surface—the heat, in fact, striking it from the bottom, sides, and top at the same time, and consequently passing through it from several points at once; therefore it will bake very quickly, and the more quickly if light in texture, and the dough be made of weak flour, as the heat will then pass through with greater facility. But if the loaves should be put so as to touch each other, and fifty more of them be put into the oven, then, as a consequence, the heat will have less surface to act upon, and have at the same time more work to do by the addition of the fifty extra loaves, and therefore will take a longer time to do it in. These remarks apply to ordinary crusty bread; but when we come to crumby or batch bread, the difference is still more apparent, the heat of the oven being the same, and every square inch covered with closely-packed and also more numerous loaves. Then each loaf will present still less surface—in fact, will only have the top and bottom heat to depend upon, and until the whole batch becomes heated through the process of cooking will be very slow indeed.

By this explanation it will be seen that there is a considerable danger of misleading the amateur baker, if we direct him to the hands of the clock for a guide as to the time in which a batch of bread will be baked, instead of teaching him to rely upon his own experience and judgment in these matters. The best and safest way to proceed is to open the oven door a few minutes before the time in which you think the bread will be done; and if it *looks* done, draw a loaf out and try it, by pressing (not too hard) upon the softest-looking part; if the pressure results in an indentation, then the bread is still doughy and underdone; but if upon pressure it springs back again into its former position, as a piece of ordinary sponge will do when relieved from pressure, then, if it is an ordinary-sized loaf, it will be done.

In heating the oven to bake bread avoid extremes. A rash and scorching oven will destroy both appearance and material. A

cold oven does not bake the bread, but *stews* and dries it, making the loaf unsightly, and unpleasant to the taste. Short of actual burning, a hot oven is always to be preferred to a cold one; the bread will be whiter, and have more moisture in it. The heat that exhibits good workmanship, finish, and perfect baking is what bakers call "a good sound heat." If there is no pyrometer, or heat gauge, get one put in; it will save much anxiety and loss. If you have one already, 500° F., or if centigrade 250°, will be a good heat for a 7, 8, or 9 bushel batch. If a smaller batch, say 4 bushels, then 400° will do. But although these are helpful, they are liable to get out of order; therefore we say again, use your own judgment. *Get to know your oven*; watch it carefully, and you will soon know, by many little signs, the heat of the oven. Sometimes a side-flue oven "clears" (looks white) straight up the middle, or on the opposite wall to the furnace, or the door-handle gets hot at a certain heat, etc. The size of the white patches will generally be a safe guide to the heat, for whiteness is a sign of heat when in connection with fire. A black, smoky-looking oven will mean coldness, unless the coals are very "dead," and smoke very much. If the oven is externally heated, it will be seldom necessary to let it "lay down," because if "continuously" used it will always be "sound," and the firing can be gauged by the pyrometer as the baking proceeds.

SOME PRACTICAL APPLICATIONS.

Costs, Labour and Machinery.

Two points at least are gained by the bakers using the straight dough process referred to in the previous pages. First, that without depreciation of what is termed quality in bread (apart from that of flour) there is greater simplicity in detail, and a better, nicer loaf; and second, that its adoption will lessen the worry, save space and plant, and make the working of an eight-hour day of easy accomplishment if it became a legalised fact.

Money is the chief object of a commercial business; it cannot be legitimate otherwise. Few poor men—if sane—will expend money, and accept the responsibility of a baking business for the love of it only. Profit must be the idea, and rightly so; though if business men ignore opportunities for the display of humanitarianism, and forget that the operative suffers from the usual ills that flesh is heir to—aching muscle and anxious mind—that he also needs money wherewith to purchase bread, bed, boots, and

books for himself and family; if he does ignore these facts, though he is a wise business man, he is also inhumane, a promoter of strikes, and a begetter of profanity and crime. A display of human kindness acts as an antiseptic to strikes. Few operatives can be induced to strike if they have kind employers; and this system affords a cheap means of being kind, for it will relieve the severe strain consequent upon a continuance of the ancient processes. It will also save the money outlay upon mashing, fermenting, and sponging utensils, and the rooms or space required to use them in; and the uncertainties attending these old, cumbrous methods will be replaced by the simplicity and exactness of science.

The explanation of the theory of this modern process follows these examples in practice. The recipes will adapt themselves to either manual or machine work, but the figures are calculated upon the use of machinery and other appliances of a modern bakery.

The first use of a dough-mixer generally results in disappointment, and it is looked upon as a very doubtful gain. In many cases the operative, to whom its advent should be as water in a desert place—refreshing—and as welcome as a two-shilling-a-week rise in salary, is the first to jib, grumble, and wish it away. Why is this? Is it because it cannot do its work properly, because good bread cannot result from its use, because it "kills the dough"? No; the reason cannot be found in these complaints, for some of the best bread to be found on this terrestrial globe is daily being made by a machine. Shortly, the reason is to be found in the fact that, in nearly every case, the operative and master want to continue the same process of manufacture which has been the custom of the shop, and it is the effort to do so that produces unsatisfactory results. The first effect of the introduction of machinery is an entire change in procedure of work; it would indeed be a doubtful gain if it did not. It is doubtful economy of labour to stir a sponge in a machine, slop it out into a trough, and, when ready, slop it back again into the machine; and the saving of waste is still more doubtful. A big query can also be put against the saving of time; and if added to these doubtful gains there is holey, harsh, and ugly bread, resulting from heat absorbed in process of making, not compensated for by any increase at the start, it is not to be wondered at that master and man wish the machine safely back again in the engineer's shop, and in many cases discontinue its use.

The installation of bread-making machinery is an unalloyed blessing to all. It is hygienic, it is labour-saving to the man, and it does better work for the master; and where the results do

not please, an effort must be made by the worker to alter his mode until successful, being quite sure that if good bread is not turned out, it is the fault of the man, and not of the machine. The operation performed by the mixer is so simple that it cannot be its fault.

A cold, backward dough usually results from the first use of a machine, the worker having omitted to allow for the loss of heat taken up by it into its own body. Its iron arms are not kept hot by circulating blood; fleshly arms are. Men's arms and bodies *give heat to* the dough; the arms and body of the machine *takes heat from* the dough; and therefore, in every case, machine-made dough should be worked warmer than when made manually, and especially so when doughs are made in it with lapses of time between each mixing; for, in that case, the heat taken from the dough up into the machine is given out again to the surrounding atmosphere before the next dough is made; but if there are several doughs made continuously without any interval, the succeeding doughs should be worked at a lower temperature than the first dough.

Observe, next, that sponges and doughs worked in a machine will take longer to mature by reason of being better made, and not because they are "felled" and "killed." Every atom of flour in a well-stirred sponge or dough is brought into contact with the yeast and moisture, and if not altered will show immaturity. This is so whether the work is done by man or mixer. All practical men know that the more work put into a sponge or dough, the longer it will take to work through. To put a piece of dough upon the brake, and give it a good braking, is to delay its maturity an hour or two; but the result is the difference between silk and sacking. It is much easier to stand and watch a machine make dough than to make it one's self; and therefore, in the majority of cases, doughs made by a machine receive double the making received by hand-made dough—sometimes more than is necessary to good work. Oh! ye buyers of flour and sellers of bread, trail your memory back over the many years, with their myriad "cat's-head" scrap and "peas" containing doughs, and contemplate the saving that would have been effected had every atom of that unused flour taken up its share of water. Contemplate also the necessity of each atom of flour taking up its share of water, if a righteous law compels its fulfilment in exacting from you two pounds of bread in each loaf, and competition compels you to sell that two pounds of bread at a close price.

Note.—The preceding pars were published in the fourth edition, and in the main represent facts to-day; but since then the introduction of weighers and dividers for loaf bread

dough accentuates the remarks about over-manipulation and change of procedure. *Caution.*—The dividers and weighers manipulate the dough again, and therefore all the earlier processes should be carried through with as little work upon the flour as possible; the danger to be avoided is the too much breaking up of the tissue of the flour.

It will probably be pointed out that the quantity of bread to be turned out will not permit the increase of time required by machine-made dough. In that case, it will be necessary to do exactly the same as, under the same circumstances, you would do in the ordinary way, namely, to force maturity by increasing the quantity of yeast and textis, as well as an increase of heat and a decrease of salt; in fact, to use the same means as when by hand-making. Time is a potent factor.

Examples.—1. For a trade of sixty sacks per week—without odd parcels of special and small breads—with an installation of machinery, comprising two externally heated and preferably draw-plate ovens, with special steam reserve, two-sack dough mixer, five H.P. gas engine, four two-and-half sack size dough trucks, a water-tempering tank with hot and cold water, and a delivery adjustment; a flour bin and sifter, and, if possible, weigher; over-mixer, and if the ovens are not close to moulding boards, two nests of trays on trolleys, or two travelling racks; two to three dozen loaf-carrying boards; four ten-gallon ferment tubs; and four and a half men at salaries—one at 35s. per week, two 30s. each, one at 25s., and one at 12s. 6d., being £6 12s. 6d. a week, or 2s. 2½d. per sack. If peel ovens are used, five and a half men will be required, and if there is no tempering tank with hot and cold water, and no sifter, then six men will not be too many.

Mode of Working.—The half man—meaning half time of a man—will be required to be in the bakehouse when the others have gone, and his duty will be—eight hours before the time of the other men commencing work—to put in two ferments with 1½ lbs. pure best yeast, 7 lbs. flour, 2 ozs. sugar, and 7 gallons water at 84°; two hours afterwards he will light the ignition tube, and having previously got flour ready in bin, proceed to make dough with one of the ferments and 21 gallons of water at temperature—*query*—this will fluctuate. With the flour at 65°, and bakehouse and mixer at 70°, take the 21 gallons up at 100°, 5 lbs. salt, ½ lb. of one of the bread improvers, and four bags of flour less the 7 lbs. in ferment, but the quantity of flour must also fluctuate to suit the sort used and the firmness of the dough required. Set the engine at work—it should be alight ten minutes before required, not more—and make dough two minutes each action, four times reversed, that will be eight minutes total; turn out, and make the other

ferment up in the same way, but keeping it 5° colder to allow for the hour longer it has to lie. The first dough should be made so as to be quite four hours in trough before men come to work. When the two doughs are made, take out the clinkers in furnace, and stoke up with coke. After the previous day's baking is done, the furnace should be filled up with any rubbish that requires burning, and the dampers half closed. When furnaces are stoked, and the place left clean and tidy, put in two more ferments the same as before. This man can then go home until seven o'clock in the morning, when he will probably be useful in cleaning up until ferment time again. Give the doughs plenty of trough room.

There will be these two doughs quite ready when the four men come in, two of whom will proceed at once to light gas-engine, and make up the two ferments into dough, and put in the remaining ferment or ferments as required; the other two men will throw out (table), commence scaling the dough, the others joining them as quickly as possible after dough is made, and getting two ovens full as soon as possible. These two doughs will fill the two ovens twice. Then half-hour for breakfast; and throw out the next dough. The draw-plate should not be pulled out until all the bread is moulded, which operation should be quick work. When moulded, have half the moulded loaves each side, pull the plate out, shut down the door, brush dust off plate, and two men each side will fill it in from two to three minutes; while filling, let the water dribble into cup for oven; push plate in quickly, and bake for forty-five minutes. The Pyrometer should register 240 to 250°. The filling, baking, and emptying will take about an hour, and the first four batches should be out in four and a half hours. When the draw-plate and this installation are used, one sack an hour, allowing for two meal-times, should be the rule for four men who are quite fresh, and have had no heavy work, or two and a half sacks a day to each man. The heat of doughs following the first can be easily adjusted—slower or faster to suit.

2. If a fuller, freer loaf is desired, add to each ferment 28 lbs. more flour, and 1 lb. instead of 1½ lbs. yeast; 5½ lbs. salt, and 5° colder in dough; adjust the time the doughs lie to meet the requirements of style desired. This will have more life and spring in it, and tops should be put on earlier, both to suit strength of flour and the tightness of dough.

3. Straight doughs, ¾ lbs. yeast, 280 lbs. flour, 3½ lbs. salt, 140 lbs. water at 90° F., and 10 lbs. of scalded flour; or better, if there are many batches, 14 lbs. dough of the last dough worked up into the next, make dough straight up. Let dough stand nine hours, mould and bake.

4. 1 lb. yeast, 1 lb. malt extract, 3¼ lbs. salt, 280 lbs. flour, 142½ lb. water at 95° F. Prove dough six hours.

5. 2¼ lbs. yeast, 1 lb. malt extract, 2¾ lbs. salt, 145 lbs. water, 280 lbs. flour; heat of water, 100 to 110° F. Dough to prove three hours; mould and bake.

The examples as to time are near enough to fit all bakehouses, but the capable workman, in a trial or two, will be able to fit his time to his work to a few minutes.

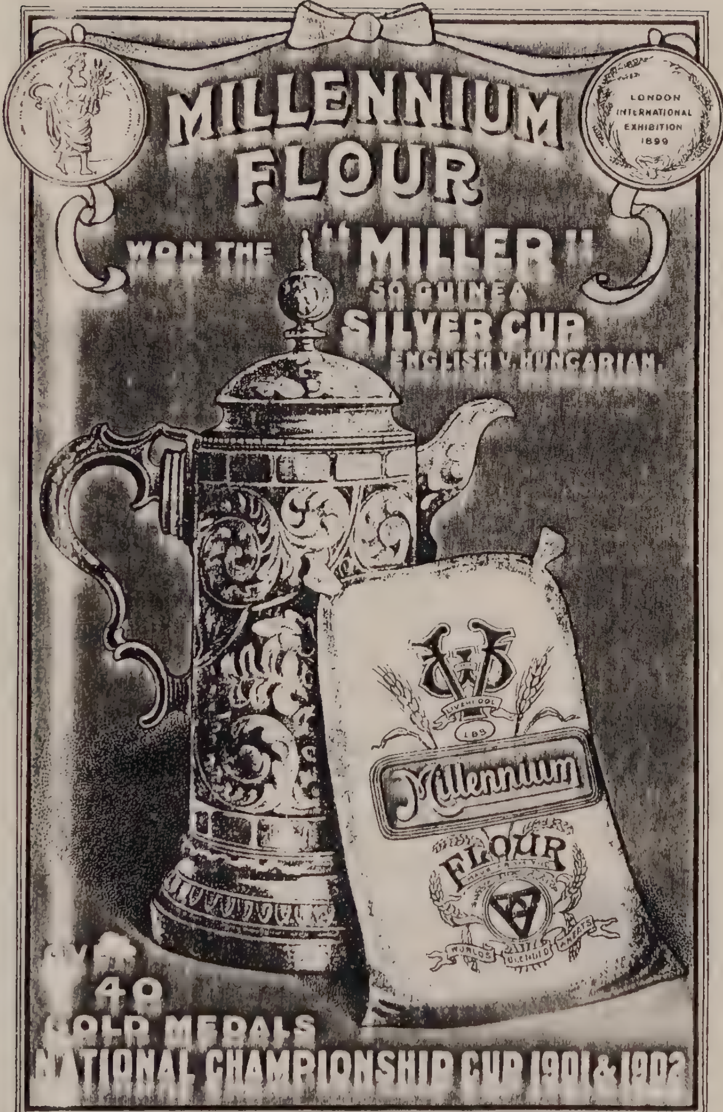
Sponge stirring is wasteful of material, and uses up time and energy, and therefore should be discarded. It savours too much of those days of yore when it was the custom to buy cheap flour, and spend unlimited time upon it to make it look good in the loaf; when the shape of the loaf and wash on the outside were considered of more importance than the colour and flavour of the inside. Modern buyers of bread have not been slow to support the more modern and progressive mode of baking bread to eat, and not to look at; and those businesses which have spent an extra shilling in flour and a few pence in diastase, and cared little for the look of the loaf, have mostly received the lion's share of support.

The shapes of bread which require much more time in moulding and shaping, such as plaits, extra long loaves, etc., should be discouraged. They take twice the time to mould than the plainer sorts—coburg, cottage, and square—and require more room in oven and care in baking, and thus cost 100 per cent. extra for labour, or two men instead of one. If you cannot get an extra farthing for them, don't make them; leave them to the baker that likes to serve faddish buyers, and accommodate them with a month's credit as well. It is in some of these seemingly simple points that certain of the old shops are losing ground, and giving place in the trade to new firms, whose system is more simple, and what they save in this way they give to the public in improved flour; and the public are not blind, especially those who are prepared to pay. People know the value of ready-money nowadays. Made by the modern process with machinery, this is how the cost works out on the lines stated:

A patent—worth, say, £1 6 0 | And a country ... 1 2 0

Or, one whites and one household town flour will make fine eating bread in the way described—per 280 lbs. ...	£1	4	0
Labour	0	2	3
Fuel	0	0	4
Salt	0	0	1
Yeast and Bread Improver, ...	0	0	10
Total	£1	7	6
Add to this a halfpenny for delivery ...	0	3	10
	£1	11	4

94 quarterns at 5d. = £1 18s. 4d. Gross profit, 7s. per sack.


MILLENNIUM
FLOUR
WON THE "MILLER"
50 GUINEA
SILVER CUP
ENGLISH V. HUNGARIAN.
LONDON INTERNATIONAL EXHIBITION 1899
Millennium
FLOUR
OVER
40
GOLD MEDALS
NATIONAL CHAMPIONSHIP CUP 1901 & 1902

THOSE BAKERS

Who use the most

MILLENNIUM

Make the

MOST PROFIT.

Give it a

THREE MONTHS' TRIAL.

W. VERNON & SONS, Liverpool.

RECIPES — CAKES, PASTRIES, BISCUITS, FLOUR AND SUGAR CONFECTIONERY.

POCKETS control pulses and palates; but don't imitate best goods with common materials. This destroys the confidence of the public, and lowers the trade. Make cheap goods in new shapes and different mixtures. There is room for the ingenious here; imitation is not good or clever.

I have endeavoured in the following collection of recipes to cater for every ordinary want of the ordinary baker, pastry-cook or confectioner, ship's baker, and restaurateur. Usually there are general characteristics that apply to the varieties of the same class of goods, and I have given at the beginning of each class some general rules to be observed when preparing that kind of goods. It will be useful, therefore, when working from these recipes, to go back to the commencement of the section to see what hints are there given. This will enable the worker to get better results, by inviting him to always *prepare his goods with brains*. Try and find out the principles which underlie the cake or biscuit, etc. Don't work like an automaton. I have not given in the recipes the weights, or prices of goods to be sold at; this must be gauged by the expense of raw material, labour, and other expense. Ascertain the gross cost of production and distribution, and put on 25 per cent. for gross profit, or to suit the system of cash or credit or other special features, but do not starve the maker for the benefit of the buyer.

To cream Butter for Cakes.

It is most important, in making nearly every kind of cake, that the butter and sugar be creamed previous to the eggs going in, and that the eggs be put in one or two at a time, and beaten before the others are added. In cold weather the danger is that the cold eggs will set the butter, and refuse to amalgamate with it, and what bakers term curdle the mixture; therefore the butter should be slightly warmed before and during the time of beating, to make it cream or work up quickly and lightly, and the eggs should be stood for a few minutes in warm water to take the "chill" off, and help the albumen to expand freely. The danger to be avoided is the melting of the butter into oil, and then it is impossible to get enough air into it, or to expand the egg and make it light and frothy; the thin oily butter continually falling

upon these small air-balloons, as it were, breaks or allows them to escape out of the mixture. Also *note*, that after the egg is beaten, there is a danger of destroying some of these said air-cells that have been formed; therefore in adding the flour, etc., to a cake after beating the eggs, never work it about more than is barely necessary to incorporate such flour or other ingredients; handle the mixture lightly and quickly, but don't be afraid of putting plenty of labour into the creaming or preliminary beating of the eggs, sugar, and butter; the more beating, the lighter the cake.

This lightness of handling, as well as speed in working off, must be more particularly observed, when the lightness of the cake depends upon the effervescence of gas from baking powders. If a cake is poor, and has to depend upon this gas for its lightness, and either by roughness of work or waste of time the gas escapes, there is very little hope that it will be light. It is sometimes difficult to get all the eggs into rich mixtures without curdling; a handful of the weighed flour thrown in while beating will obviate this. Whenever baking powder, carbonate of soda, and cream of tartar are used in cake-making, they must always be sifted and well mixed in the flour; volatile (ammonia) must be powdered and beaten up with the mixture, or dissolved in the milk; but it is not necessary to hurry it into oven, as moisture does not decompose it as it does the other acids and carbonates. It is disunited, and gas is evolved by heat of oven. In mixtures wherein there is a good proportion of aerating the flour should be well mixed in.

Baking Powder.

In the recipes where baking powder is mentioned in this book, it invariably means the recipe in the list as Baking Powder No. 1.

Test the Eggs.

Eggs form so important a part in the preparation and successful turning out of the goods, that each egg must be tested. One musty egg will spoil the largest mixture beyond remedy; therefore crack and smell each egg separately. A thin, watery egg will not injure the flavour; but where lightness and strength are required, the eggs should be *quite* fresh.

Get the Ingredients ready.

In making up goods, always get the ingredients ready. Before beginning the preparatory beating, etc., see that the cake-tins,

hoops, or baking tins are ready; currants, etc., washed, picked, and weighed; peel cut; flour, butter, sugar, eggs, all weighed; and then the mind will be left clear to work out the necessary formula and directions. Also be sure and watch the process in every stage; be most careful about small details, such as the flavouring, baking, sending up or displaying; and, above all, beware of dirty pans or cooking utensils, and grit in the fruit.

Spice in Cakes, etc.

Nearly all those flavourings that come under the head of spice, if used in cakes, buns, and biscuits in very small quantities, generally improve the palatableness and aroma. Spice is harmless to the majority of persons, and in nearly all cases is considered a great improvement, though it has of late become unpopular with delicate persons and palates, owing to its having been used in certain dishes with too free a hand. This is to be regretted, as sometimes it saves a dish from being positively insipid. Few would think of objecting to the delicate flavour imparted to their custard by the addition of a bay-leaf or a piece of cinnamon, or to the clove in their apple tart; but if through the ignorance of the cook our tart has been spoilt by the addition of twenty cloves instead of three, or the custard appears to be only a dish of bay-leaves, shall we, for that reason, universally condemn the use of these extremely useful flavourings? The same may be said of mace, nutmeg, and all the tribe of spices, not even excepting the much-abused pimento or allspice. The addition of a few drops of mixed spice to any fruit-cake mixture or buns, or of powdered cinnamon to the Madeira, or of nutmeg and a glass of rum to the Genoa cake, will improve them. Having said this much, we leave the matter of the use of spice to the tastes and discretion of our readers. Essence of spice is preferable; it does not discolour the goods.

Butters and Fats.

In many of the recipes which follow, the word butter occurs, but in many cases merely means the fat ingredient in the mixture. Either of the wholesome, non-odorous, edible fats now upon the market will answer the purpose intended. These animal and vegetable fats are various in manufacture. Some of them are a mixture of beef fat and lard; some have a portion of pure butter or milk blended with them; and some are unmixed, refined, edible fats of nuts and seeds. The desideratum is that any of these fats, if used by confectioners, shall be pure, wholesome, and non-odorous.

Glycerine, as a non-drying ingredient added to cake mixtures, will help to keep the baked cake moist and soft. The proportion to be used must be governed by the character, degree of richness, of the mixture it is incorporated with; 1 per cent. is usually the quantity for ordinary slab cakes.

Machine-made Slab Cakes.

If for ordinary low-priced, use one of the non-odorous fats on sale for this purpose; if for a better class article, use only pure, good butter. If for ordinary fruit cake, use only currants and peel; if for a better class, use the same weight but a greater proportion of sultanas than currants; use also dried cherries.

74 lbs. of flour (high in gluten percentage, but the gluten soft and unstable), 28 lbs. fat or butter, 37 lbs. castor sugar, 40 lbs. currants, 8 lbs. drained peel, 22 lbs. eggs, 1 lb. of glycerine, 8 ozs. cream of tartar, 6 ozs. bicarbonate of soda, 9 to 10 quarts separated milk (not too fresh), a little egg colouring and flavouring essence. Use the colour and essence sparingly; the strength not being known, the quantity cannot be stated. Place the fat and sugar in the machine. If the weather is cold, the machine or the fat should be warm. Set on slow motion for a few minutes to mix it, and then cream up with the fast motion. When creamed, add the eggs, a few at a time, keeping on the fast motion. To prevent the eggs chilling the mixture, previous to cracking, place them in a vessel, and cover with warm—not over 100° F.—water for a few minutes; this will be better, safer, and cleaner than making the sugar hot before using. When all the eggs are in, and the essence and colour, stir in, with the slow motion, the flour, fruit, milk, and raising powder. The powder should be well mixed into the flour, and if the fruit is quite dry, it should also be mixed into the flour before it is added to the mixture; but if the fruit is not dry, shake it rapidly over the mixture while the flour is being mixed in by the slow motion.

Cherry Cake.

70 lbs. flour, 28 lbs. butter, 36 lbs. castor sugar, 25 lbs. eggs, 30 lbs. glacé cherries, 7 lbs. citron peel, 1 lb. glycerine, about 8 quarts milk (separated, sour), 7 ozs. cream of tartar, 4 ozs. bicarbonate of soda; egg colouring and flavouring essence. Cut the cherries into halves. The citron should not be too finely cut. Cream up and mix as before directed.

Plain, Seed, Madeira.

1 lb. glycerine, 65 lbs. flour, 32 lbs. fat or butter, 30 lbs. eggs, 40 lbs. sugar, 6 ozs. cream of tartar, 4 ozs. bicarbonate of soda,

7 quarts milk (separated and sour); essence and colour. If for rice cake, add 3 lbs. ground rice, and take away 3 lbs. of flour. Cream and mix as before directed.

Rich Slab Cake.

To every 22 ozs. of the best white flour, add 17 ozs. castor sugar, 16 ozs. best butter, 16 ozs. of eggs, and 5 drops essence, lemon, vanilla, or best brandy. If for fruit cake, add 16 ozs. of fruit, made up of equal parts of glacé cherries, citron peel, and sultanas. Use no other colouring matter, no raising powder; but choose eggs having a dark yellow yolk. Cream butter and sugar; beat in the eggs, and mix as directed.

Plain Cakes (Ordinary), in Small Sizes.

Cream up 2½ lbs. castor sugar with 2 lbs. fat or butter; then beat in 1 lb. 14 ozs. warm eggs; then add 5 lbs. of flour, with which has been mixed 2 ozs. raising powder, in proportions of two parts cream of tartar to one part bicarbonate of soda and a pint and a half milk; mix a few drops of essence and of colour in the milk. Mix the whole as directed, and bake in (about) one or two pound sizes. If for cheap Maderias, dust the tops with sugar and place two thin slices of citron peel on each cake before putting them into the oven.

Rich Plain Cakes—Madeira, etc.

Cream up 5 lbs. butter (best) with 4 lbs. castor sugar; beat in thoroughly 4½ lbs. of eggs, warm, if weather is cold or the butter is firm; then add the grated rind of three lemons, ½ lb. finely-chopped citron peel, 5 lbs. of best flour, and a gill of brandy. Mix the whole smoothly, and bake in medium-sized cakes. The addition of 2½ lbs. of fruit will make small, good fruit cakes. For best fruit cakes, use always a fair proportion of sultanas and cherries; be sparing with currants.

Plain, Common Cakes.

3¾ lbs. sugar and 3 lbs. fat, creamed together, then 1½ lbs. eggs beaten in; then add 9 lbs. of flour, 3½ lbs. currants, 1½ lbs. peel, ½ lb. fine desiccated cocoa-nut, 3 ozs. cream of tartar, and 1½ ozs. bicarbonate of soda (mixed into flour), and 2½ quarts stale separated milk, into which essence and colour have been stirred. Mix the whole into a smooth dough, and bake in small-sized cakes.

Large Halfpenny or Penny Common Cakes.

3½ lbs. flour, 1¼ lbs. fat, 1½ lbs. sugar, 7 eggs (12 to 14 ozs.), 1 pint and a half stale separated milk, piece of ammonia (as large as a medium-sized pea), 1 oz. cream of tartar, ½ oz. carbonate of soda, essence of lemon and yellow colouring. Powder the ammonia, and mix with the milk, and essence and colour; mix the tartar and soda with the flour; beat up fat, sugar, and eggs in the usual way, and then mix the whole together. Put one dessert spoonful into well-greased small moulds for halfpennyworths, and two dessert spoonful into larger moulds for pennyworths, and bake in a fairly hot oven. For variety, a few currants can be added to some of the mixture, and fine desiccated cocoanut to some of it, with a little sprinkled on the top before baking, and some baked plain; and these, when baked, masked on to with fondant or water icing.

Sponge Cakes.

2 lbs. 6 ozs. castor sugar, 2 lbs. 6 ozs. flour, 3 lbs. of warm (90° F.) eggs. Beat the eggs and sugar together, with whisk or machine, until when some of it run from a spoon over the top of the mixture does not sink immediately, or the marks become quite obliterated in less than five seconds. When beaten enough, stir the flour into it, gently, lightly, but thoroughly; then fill into the prepared shapes; dust the tops with sugar, and bake.

Savoy (Sponge) Fingers.

2 lbs. of sugar, 2 lbs. flour, 2 lbs. (and 4 extra yolks) of eggs. Beat and mix up as for sponge cake, lay out in finger size upon paper, dust over with sugar, place on a baking sheet, and bake in a fairly hot oven.

Savoy (Sponge) Moulds.

2 lbs. castor sugar, 2 lbs. flour, and 2 lbs. 2 ozs. of eggs. Beat and mix as for sponge cakes, and fill into prepared moulds in quantities of not less than ¾ lb. each cake; bake in oven at a moderate heat.

Swiss, Victoria (Preserve) Roll.

1 lb. castor sugar, 1 lb. flour, 2 lbs. eggs. Beat and mix as for sponge cakes, and then spread the mixture, upon paper laid upon baking sheets, not thicker than one-fourth or one sixth of an inch, and bake in a fairly hot oven. As soon as baked, turn upside down upon a cloth, damp the paper with water, peel it off and spread the preserve over the whole of the surface, and then roll it into a roll.

Note.—The flour used in all sponge cake mixtures should be finely milled, soft and white; not hard, stable gluten, or

coarsely granulated. The eggs, when possible, should be chosen with dark yellow yolks; if very pale, the goods have rather a bready appearance. The shapes or moulds should be carefully greased with a clarified fat, and dusted with fine white sugar and flour after greasing. The baking should be as rapid as possible, up to the avoidance of the slightest approach to scorching. Any flavouring essence should be added about a second before the beating is finished. To make cheap and common sponge goods, add as much flour as desired, with enough moisture to saturate, and raising powder to aerate; it is all that is necessary, except perhaps some egg colour, to give it the tinge of yellow proper to a sponge cake.

German Sponge Cakes.

½ lb. sugar, 10 eggs, 6 ozs. butter, ½ lb. flour, the juice of a lemon, and a little grated rind of ditto. Beat the eggs and sugar as for sponge cakes, cream the butter, stir in the lemon juice and rind, add the flour and the beaten eggs and sugar, fill small well-buttered moulds, and bake in a moderate oven.

Sponge Cake with Apple Foam.

Cut a small sponge cake into slices, lay in glass dish, and pour over them enough sherry and cream to moisten them through. Put a few peeled and cored apples, with a gill of water, 1 oz. sugar, and the juice of a lemon, in a stewpan, and boil down carefully to a thick pulp; rub it through a sieve, beat it to a froth, and having whipped the whites of 8 eggs to a *meringue* consistency, mix the two together, and put it in a rough, uneven shape on the slices of sponge cake.

Tipsy Cake (Plain).

Get a Savoy cake (a stale one is the best), stick it all over with blanched almonds cut in strips, place it on a glass dish (which should be a round one), and pour over it one pint of sherry, with half a quartern of brandy; as the wine runs through, put it back with a spoon until soaked through. Make a boiled custard in the following manner: Break 5 eggs into a basin with 2 ozs. of fine sugar; place 1 pint of milk on the fire, and let it come to the boil; pour it on the eggs, and whisk well together. Place it over the fire, keep stirring until thick; but on no account let it boil, or it will curdle and spoil. Pour it over the cake, sprinkle over with some nonpareils, flavour the custard with a few drops of essence of almonds of vanilla.

Madeira Cake.

1. ¾ lb. butter, ¾ lb. castor sugar, 1 lb. flour, 1 lb. of eggs. Put the butter and sugar into a pan large enough to hold the

mixture; stand it near the fire, or in hot water, to soften the butter, but not to melt, or it will not cream properly; when softened, beat until it resembles thick whipped cream (this is called "creaming the butter"). When ready, add the eggs, one at a time, beating the mixture to a cream again after each egg; add 4 drops of essence of lemon, giving one or two turns, then stir in the flour; as soon as it is smooth, and the flour is incorporated, it will do. These cakes are usually baked in small round hoops or tins papered, and placed upon a baking-sheet. When ready for the oven, sift over them some fine loaf-sugar dust, sprinkle gently with water, lay on each cake two thin slices of citron, and bake in a cool oven. Being very light, these cakes should not be shaken or taken out of the oven until done, or they will sink in the middle. During the baking they usually break open on the top, and when not sufficiently baked this opening will look moist.

2. 2½ lbs. flour, 2½ lbs. butter, 2 lbs. sugar, 2¼ lbs. eggs, the grated peel of 2 lemons, ½ lb. citron peel cut small, a little grated nutmeg, pinch of powder, and a glass of brandy. Mix as before directed, and bake in small sizes.

3. *Light.*—2 lbs. butter, 2¼ lbs. sugar, 2 lbs. eggs, 2¾ lbs. flour, piece of volatile the size of a pea, 6 drops essence of lemon, enough powdered cinnamon to cover a sixpence. Cream carefully; mix and bake in the usual way.

4. *Commercial.*—8 lbs. butter, 9 lbs. sugar, 9 lbs. eggs, 12 lbs. flour, ¾ oz. cream, ¾ oz. carbonate soda, 8 drops essence of lemon, about a pint of milk.

School Cakes.

1. *Seed.*—This is a good luncheon or tea cake: 2 lbs. butter, 2½ lbs. castor sugar, 1½ lbs. eggs, 6½ lbs. flour, 2 ozs. powder No. 1, 2 ozs. caraway seeds, 3 pints milk, ¼ lb. peel (chopped fine). Cream the butter, sugar, and eggs as for pound cakes, then add the peel and seeds, giving it a turn or two; put in the flour and milk, stir rapidly and thoroughly, and as soon as the flour is incorporated, transfer to tins previously prepared, and as quickly as possible put into the oven, or the effervescence which has begun will quickly subside, and the cake will not be so light as it otherwise would be. This cake, being very light and not over-rich, does not keep long. It should be eaten quite fresh.

2. *Currant.*—Mixture same as for seed, with the addition of 2 lbs. sultanas, 2 lbs. currants, ½ lb. peel. These ingredients should be added before the flour. Omit the seeds.

3. *Balmoral Lunch.*—10 lbs. butter, 11¼ lbs. sugar, 11¼ lbs. eggs, 25 lbs. flour, 10 ozs. powder, 10 lbs. sultanas, 6 lbs. peel, 6 pints milk, few drops essence of spice and almonds.

Pound Cakes.

1. 1¼ lbs. eggs, 1 lb. sugar, 1 lb. butter, 1¼ lbs. flour, 1 lb. sultanas, currants and peel mixed, piece of ammonia as big as a pea. Put the butter and sugar into a pan large enough to hold the mixture, stand in hot water to soften the butter, so that it will beat up easily into a cream; it must not melt, or it will not cream properly. When soft, beat until it resembles thick whipped cream. Now add the eggs, one at a time, beating the mixture to a cream again after each egg; add the fruit and peel, giving the mixture a turn or two, stir in the flour, weigh off into sizes required, and bake in a sound oven. Powdered cinnamon, enough to cover a sixpence, will greatly improve these cakes; dried cherries are a good addition.

2. 10 lbs. flour, 7 lbs. sugar, 5 lbs. eggs, 1 oz. volatile, 6 lbs. butter, 4 lbs. sultanas, a few currants on top, allspice; powder the volatile, and beat it with the butter, sugar, and eggs; cream and mix as usual. Enough milk to make a smooth, soft dough.

3. *Small.*—1¼ lbs. butter, 1¼ lbs. sugar, 1 pint of eggs, 1 lb. fruit, ¼ oz. volatile, gill of milk, 3 lbs. flour; powder the volatile into the butter, and cream as usual.

4. *Small.*—1 lb. butter, 1¼ lbs. sugar, 1 lb. eggs, 3 lbs. flour, 1 pint milk, 2 ozs. powder, ½ lb. currants, and a piece of volatile size of a pea; beat the volatile with the butter and sugar, sift the powder with the flour, mix as usual; put a full tablespoonful into small round hoops placed upon a baking tin, and bake in a hot oven. The hoops should have paper collars in them.

Christmas or Fruit Cakes.

2 lbs. butter, 2 lbs. sugar, 2½ lbs. eggs, 3 lbs. flour, 4 lbs. currants, 4 lbs. sultanas, 1 lb. mixed candied peel (chopped fine), 1 nutmeg (grated), a pinch of mixed spice, milk about a gill, to make the mixture soft and pliable. Prepare the mixture the same as for pound cakes; place in large-sized cake tins, and bake in a cool oven thoroughly. These cakes ought not to be eaten for some days, but should be put away in a cool, damp place to allow the atmosphere to act upon the juices and saccharine matter, and cause fermentation, which produces that fine flavour so much appreciated in bride cakes, etc. The cakes should not be allowed to scorch, as this destroys their flavour and impairs their digestibility.

Birthday Cake.

1 lb. butter, 1 lb. sugar, 1 lb. eggs, 1 lb. flour, 1 lb. sultanas, ½ lb. cherries, 1 lb. peel, 1 lb. currants, and a pinch of spice. Cream butter, etc., as directed; add fruit, etc., and bake in a cool

oven. When cold, ice white, and write name and date, and "Many happy returns of the day," in pink icing-sugar on the top. Ornament sides either with sugar or frilled paper, etc. Dried cherries in place of currants for a better class cake.

Bride Cake.

1. 1½ lbs. butter, 1½ lbs. sugar, 1½ eggs, 2 lbs. flour, 1 lb. chopped almonds, ½ lb. dried cherries, 1½ lbs. sultanas, 3 lbs. currants, ¼ oz. spice, and gill of brandy. Cream butter, etc., the same as directed; add fruit and flour, mix well, and put into well-papered tins, and bake for four or six hours in a cool oven. Bake on double tins. If the oven has got a sound bottom, put a few ashes between two tins and put the cakes upon the top tin.

2. 3 lbs. butter, 4½ lbs. sugar, 3 pints eggs, 4½ lbs. flour, 2 lbs. cherries, 6 lbs. sultanas, 2 lbs. currants, 3 lbs. peel, 1 lb. chopped almonds, ½ oz. spice, 6 drops essence of almonds, ½ pint brandy. Cream and mix as before. These cakes should be baked in a cool oven. Place some ashes upon a tin, and then put the tin that has the cakes on upon the ashes.

Rice Cake.

½ lb. butter, ½ lb. sugar, ½ lb. eggs (4), ½ lb. flour, ¼ lb. ground rice, tablespoonful of milk, ½ oz. powder. Cream butter and sugar usual way, and bake in cool oven.

Cocoa-nut Cake.

¾ lb. fresh butter, ¾ lb. sugar, 1 lb. flour, ½ lb. cocoa-nut (desiccated or grated), ¾ lb. eggs, and a gill of cream or good milk (if sour, it will be better), 1 oz. of powder. Cream the butter, sugar, and eggs as usual for cakes; then add cocoa-nut, flour, and cream, and bake in a good sound oven; the prepared flour to be sifted with the flour previous to putting it in. When baked, ice with ordinary icing, or with *meringue*.

German Kouglauffe.

10 ozs. fresh butter, 1 lb. flour, 2 eggs, ½ oz. powdered cinnamon, ½ oz. grated lemon-peel, 2 ozs. sugar, 1 oz. yeast, 1 oz. "Textis," and 1 gill of cream. Warm the cream, stir into it the eggs, yeast, "Textis," sugar, and a little of the flour. Put this away for half an hour to rise; then beat up the butter to a cream; mix with it the ferment and the whole of the ingredients; make them into a smooth batter, well butter a mould, put the mixture into it, and let it stand a quarter of an hour, and then bake in a moderate oven.

Dundee Cakes.

1. 1 lb. sugar, 1¼ lbs. eggs, 1 lb. butter, 1¼ lbs. flour, ½ lb. peel, ½ lb. almonds, 1 lb. sultanas, 1 gill brandy. Cream the butter and sugar, add the eggs, mix the flour and the fruit as for pound cakes, putting the brandy in with the flour; when in the tins, put a few caraway comfits on the top, sift or dredge some castor sugar over them, sprinkle with water, and bake in not too hot an oven.

2. *Seed.*—1¼ lbs. butter, 1¼ lbs. sugar, 2 lbs. flour, 12 eggs, 1 lb. orange peel cut fine, ¼ lb. blanched and chopped almonds, 2 ozs. caraway seeds; mix as before. When in the tins put some large caraway comfits on top.

3. *Best.*—2 lbs. butter, 2 lbs. sugar, 2½ lbs. flour, 3 lbs. sultanas, 1 lb. peel, 1 oz. powder, 20 eggs, ½ gill rum, and a pinch of powdered cinnamon; prepare and mix as usual; when in the tins put caraway comfits on top; bake in moderate oven.

Almond Cakes.

1. ½ lb. ground sweet almonds, ½ lb. sugar, ½ lb. flour, ½ lb. butter, and 8 eggs. Cream butter and sugar as for other cakes; add the eggs slowly, beating briskly all the time, then stir in the flour and almonds together; mix carefully, and bake in sizes required in a sound oven. If a few of the almonds are beaten in with butter and sugar the eggs will go in better.

2. 1 lb. ground almonds, 1¼ lbs. sugar, 12 eggs, 1 lb. fine flour, ½ lb. fresh butter, ¼ lb. fine chopped lemon peel; cream the butter, sugar, and eggs as for other cakes; add the other ingredients, mix lightly; weigh in required sizes, and bake carefully in a moderate oven.

Almond Darioles.

¼ lb. butter, ¼ lb. sugar, ¼ lb. flour, 3 drops essence of almonds, 1 oz. finely chopped lemon peel, ½ pint cream, and 4 eggs. Cream butter and sugar, whisk eggs to a froth, mix all the ingredients well together, stir over the fire in a stewpan for ten minutes, but do not let it boil; then line some small mould with puff paste, three-parts fill them with the mixture, and bake in a sound oven. When the pastry appears to be baked the cakes will do; turn the moulds out and sift fine sugar over them.

Lemon Cakes.

¾ lb. butter, ¾ lb. sugar, 1 lb. eggs, ½ gill brandy, ½ lb. flour, the grated rind of two lemons; cream the butter, sugar, and eggs in the usual way, stir in the lemon-rind, brandy, and flour; put this into small moulds, and bake in a moderate oven.

Genoa Cake.

1. 20 eggs, 2 lbs. sugar, 2 lbs. butter, 4 lbs. flour, 2 lbs. currants, 3 lbs. sultanas, 1 lb. peel, ½ oz. cream of tartar, ½ oz. carbonate of soda powdered and sifted with the flour, 1 pint milk. Cream the butter and sugar, and mix as usual; place in one or two square tins, with edges about three inches deep, chopped almonds thickly sprinkled on top. This cake must be baked in a cool oven, and if baked in one piece will take two hours or more. The tins must be papered with stiff white paper. It is usual in lieu of square Genoa tins to cut pieces of wood the required height, and fasten them on a flat baking-tin, prop them up with pieces of brick; these are called "upsets." Sultana and peel boxes make capital baking vessels.

2. 3 lbs. butter, 3 lbs. sugar, 4½ lbs. flour, 1 lb. currants, 5 lbs. sultanas, 30 eggs, 1 oz powder, 6 drops essence of almonds, half a grated nutmeg, 1 lb. peel mixed; prepare as before, chopped almonds on top. A seed Genoa can be made with this mixture by adding 2 ozs. caraway seeds, and leaving out the fruit *and the ounce of powder.*

3. *Good.*—2 lbs. butter, 2 lbs. sugar, 3 lbs. flour, 4 lbs. sultanas, 1½ lbs. peel, ½ grated nutmeg, gill of rum, 1 quart of eggs, 1 lb. cherries, chopped almonds on top.

4. *Bulk Genoa, cheap and good.*—20 lbs. butter, 20 lbs. sugar, 36 lbs. flour, 15 lbs. currants, 15 lbs. sultanas, 4 lbs. peel, 21 lbs. of eggs, about three quarts of stale milk, ½ lb. powder, 1 oz. mixed spice; prepare as usual, with or without almonds on top to suit price charged. Pine kernels are a good substitute for almonds.

Rich Cherry Cake.

2 lbs. butter, 2 lbs. sugar, 2 lbs. eggs, 2½ lbs flour, 1 lb. cherries, cut them in halves, ½ lb. citron peel, ⅛ oz. ammonia, powdered and beaten in with butter and sugar, gill of milk.

Cocoa-nut Genoa Cakes.

7 lbs. flour, 4½ lbs. sugar, 4 lbs. butter, 2¼ lbs. desiccated cocoa-nut, 2 ozs. powder, 3 pints eggs (½ pint of wine would be an improvement). Beat and mix in all the ingredients the same as for Genoa cake, and when in tins, cover the top with cocoa-nut; bake carefully in a cool oven. For variety, do not cover all the cake or cakes before going into the oven with cocoa-nut, but keep one plain, and when that comes out ice it with icing made by beating ½ lb. of sugar with three whites; when beaten sufficiently to put on the cake, stir into the icing 3 ozs. cocoa-nut, cover the cake, and while wet, sprinkle some more cocoa-nut over it to look like frost.

Devonshire Luncheon Cakes.

3 lbs. butter, 3 lbs. sugar, 2 lbs. currants, 2 lbs. sultanas, 30 eggs, 8 lbs. flour, ½ lb. chopped peel, 2 ozs. powder, 3 pints milk, pinch of spice, half a grated nutmeg; sift the powder with the flour, cream as usual; should be baked in a good sound oven.

Sultana Cakes.

1¾ lbs. butter, 1¾ lbs. sugar, 3½ lbs. flour, 3 lbs. sultanas, 1 lb. chopped citron, 1 oz. powder, 1½ pints of milk, 20 eggs, cream as usual; when in tin put chopped citron on top.

Small Lunch Cakes (cheap).

1 lb. butter, 2 lbs. sugar, 9 lbs. flour, 1 lb. currants, ¼ lb. powder, 2 quarts stale milk; rub the butter and flour together on the board, then mix the sugar; make a bay, put in the currants and the milk, mix up quick and light; weigh into small tins as quickly as possible, and bake in a hot oven; dust the tops with white sugar.

Good Fruit Cake.

10 lbs. butter, 10 lbs. sugar, 12 lbs eggs, 15 lbs. flour, 16 lbs. currants, 16 lbs. sultanas, ½ oz. spice, 4 lbs. mixed peel, 1 oz. powder, 1 pint milk.

Rout Cake.

Cream ½ lb. butter, ½ lb. sugar, and 12 yolks; add a grated lemon rind, 2 ozs. ground almonds, ¾ lb. flour; bake as Genoa, but without almonds on top.

Turkish Cake.

Boil ¾ lb. rice in 1½ pints milk, add 2 ozs. sugar, and 4 yolks of eggs, beat it all quite smooth, add few drops essence of orange or roses; turn out in an edged pan, wash over with yolk of egg, dust with fine sugar; let cool, cut into shapes, put upon a tin about an inch thick, and bake in a sharp oven a few minutes.

Almond Sponge Cake.

1 lb. sugar, 9 eggs, ¾ lb. flour, few drops essence of almonds, 2 ozs. ground almonds, 1 oz. powder; whisk the eggs and sugar as for sponge cakes, put in essence, and lightly stir in flour; put in small battered moulds or tins; bake in sound oven.

Princess Cake.

1¼ lbs. butter, 1 lb. sugar, 1 pint egg whites, 1½ lbs. flour, 12 drops of rose-flower water, and 1 glass of sherry; cream the

butter and sugar, and thoroughly beat with them the pint of whites, adding a few at a time; having beaten these very light, put in sherry and rose water, and stir the flour in lightly; put this into buttered and papered tins, and bake carefully. These cakes are usually iced and ornamented.

Savarin Cakes.

Set a sponge with ¼ lb. sugar, 1 oz. yeast, 1 oz. "Textis," ½ pint warm milk, and ½ lb. flour. Let this rise for two hours, then beat into it until quite smooth ¼ lb. fresh butter, 4 eggs, ½ oz. powdered salt, 2 ozs. finely chopped peel and ½ lb. more flour. Let this prove or rise for one hour, then well butter one or two moulds, cover them inside with chopped almonds, tie a buttered paper round the outside, to prevent it coming over; put in the paste; let it rise; bake in a moderate oven. This cake usually forms the base for another dish, which has some liqueur poured over it after small holes have been pricked in it with a skewer.

Cinnamon Cake.

Mix ½ lb. sugar, ½ lb. butter, ½ lb. flour, ¼ oz. powdered cinnamon with the whites of eight eggs beaten to a froth; add one glass of rum; mix altogether and bake in a steady oven.

Dariole Dessert Cakes.

8 eggs, 2 ozs. sugar, ½ pint cream, 1 macaroon powdered, 8 ozs. cornflour, 2 ozs. butter, 4 drops of essence of vanilla; warm the cream; dissolve the butter in it; mix in all the other ingredients, and half fill well-buttered dariole mould with the batter, and bake in a steady oven.

Dessert Rice Cakes.

Cream as usual 1 lb. butter, 1 lb. sugar, 1½ lbs. eggs; add, when creamed, 1 lb. ground rice, ½ lb. cornflour, and 1 oz. of baking powder. Weigh into tins; bake in moderate oven.

Baba.

1 oz. yeast, 1 oz. "Textis," ½ lb. Hungarian flour; mix with warm milk into a soft dough, and prove for two or three hours; beat up 1 lb. fresh butter into 1 lb. flour, and 1 lb. eggs; work these into paste, and when the dough has well risen, mix them altogether. Mince and mix 2 ozs. candied citron peel, 2 ozs. sultanas, and ¼ lb. stoned raisins; butter a mould, half fill, let it rise, and then bake in a moderate oven.

Twelfth-day Cake.

2 lbs. butter, 2 lbs. sugar, 2½ lbs. eggs, 2½ lbs. flour, ½ lb. chopped almonds, ½ lb. peel, 2 lbs. sultanas, 1 lb. cherries, glass of brandy, 1 nutmeg, ½ oz. cinnamon; cream and bake in the usual way. These must be baked in well-papered tins in a very cool oven.

To ice Twelfth-day Cakes.—Ice and ornament as follows: 1 lb. of icing-sugar, whites of 3 or 4 eggs, enough tartaric acid to cover a threepenny-piece its own thickness. Put this in a clean dry basin, beat with a wooden spoon for about ten minutes, and it will then be ready for use. Place upon the top of the cake enough sugar to thinly cover it, and with a palette-knife work it from side to side, always keeping one side of the knife flat upon the sugar; do not take it off or turn over, or scrape the cake. After the top is well and evenly covered, draw the knife off with one sweep, and draw it round the side to gather off the loose sugar that has run over. Usually the first attempt at icing leaves the surface a little rough; lift the cake and knock it gently upon the table, which will cause some of the ridges left by the knife to fill up; put a frill of white tissue paper round the side, and one of pink, a little narrower, over it, so that the white shows a little above and below the pink. Ornament the top with twelfth-cake ornaments.

Cadogan Cakes.

Cut a Madeira or a Savoy cake that has been baked in a plain mould into slices, spread them with apricot jam, place them upon the top of each other in their former shape, ice this with icing in the usual way, but flavoured with lemon, and made with the *whole* eggs, so that the yoke will give a slightly yellow tinge. Before the icing sets, cut out a number of small leaves, or diamond shaped pieces of angelica and dried fruit, and place them evenly in rotation round the outer edge.

Small Dessert Cakes.

½ lb. sugar, ½ lb. butter, 5 eggs, 10 ozs. flour, small glass of wine, and ½ lb. dried cherries (cut in pieces). Beat the eggs, butter, and sugar as usual, add flour and wine; mix lightly all together, butter some very small moulds, and two-thirds fill them; stand them in a large cake or bread tin, bake in a cool oven; when they are done, they can be served either ornamented or plain.

Almond Rout Cakes.

1 lb. ground sweet almonds, 1 lb. sugar, made into a stiff clear paste with yolks of eggs. When the paste is quite smooth, make

it into small fancy shapes, such as garters, knots, rings, crowns, Prince of Wales' feathers, etc. If you have the blocks, and the mixture is inclined to stick, dust the blocks and board with finely powdered sugar mixed equal parts with maize starch. Melt a little gum arabic and sugar, wash some over with it and dip into nonpariels; ornament with neatly-cut small pieces of angelica and lemon peel; pipe with pink and white icing, etc.; lay wafer-paper upon a baking-tin, put the biscuits upon it, but do not let them touch each other; stand them on one side for an hour or two in a warm place—a day will not hurt them; when well hardened, bake in a brisk oven very carefully.

Almond Paste for Rout Cakes.

2 lbs. ground sweet almonds, mix with 1 lb. sugar, 2 tablespoonfuls of water; place them in a stewpan on the hot plate, and stir continually until the mixture is quite hot, and runs off the spoon; pour into a pan, allow to cool a little, then add 1 lb. sugar, 1 oz. gum-dragon, dissolved in a little water and strained, and the juice of 2 lemons. Beat this mixture for ten minutes, then turn it out upon a slab dusted with fine sugar; divide into three parts, and colour each according to taste with cochineal for red, saffron for yellow, spinach for green, etc.; make into shapes upon wafer paper, dry, and bake.

Neapolitan Cake.

½ lb. ground sweet almonds, ½ lb. sugar, ¼ lb butter, 10 ozs. flour, 2 ozs. finely chopped lemon peel, yolks of six eggs, and a tablespoonful of orange-flower water. Cream the butter, sugar, and eggs; add the other ingredients, thoroughly mix, and leave it in a cool place for an hour to harden; then roll the paste out ¼ in. thick, stamp it into rounds; bake them carefully, then place apricot jam between two rounds, and ornament to taste with pink and white icing, or sifted sugar (pink).

School Cake.

This mixture will also do for tea-festivals and school-treats, and will generally give satisfaction: Sugar, 3½ lbs., 3 lbs. butter, 1 lb. chopped peel (if peel is chopped fine it is much more economical, as it will go farther and flavour many more mouthfuls), 12 or 14 lbs. sultanas, 10 lbs. flour, ¾ lb. powder, 20 eggs, 3½ pints milk (sour milk will do very well), and ¼ oz. good spice. The same mixture for seed cakes. Omit fruit and add 2 ozs. seeds. Cream butter, sugar, and eggs as usual. Add spice, fruit, peel; give a turn or two just to cover the fruit from the flour, and then add the flour and the milk, and quickly mix the

whole. If the quantity of milk does not make it moist enough, use more. Put the mixture into tins, but not too thick. Flat cakes, about two inches thick when they are put into the oven, are best. Be sure and bake well, but do not burn.

Queen (or Heart) Cakes.

½ lb. butter, ½ lb. sugar, ½ lb. eggs, 1 lb. flour, ½ lb. currants, piece of ammonia size of a small bean, and ½ gill milk. Cream the butter, sugar, and eggs in the usual way; powder the ammonia and beat it up with the butter, etc., then add the flour and currants, and mix lightly. When filling heart cake tins (which should be well buttered), spread the mixture from the middle towards the sides, leaving the middle slightly hollowed, so that as the mixture begins to melt it will run back into the hollow, and this will consequently be longer baking; and the sides being already set, the middle will be forced up, and break open into what bakers call a cauliflower head.

Digestive Cake, etc.

3½ lbs. eggs, 3 lbs. sugar, 2½ lbs. flour, ½ lb. butter, 3 drops essence of lemon, and enough powdered cinnamon to cover a threepenny piece its own thickness, and ½ oz. powder. Whip the eggs and sugar into a light batter, the same as for sponge cakes, and just before giving the last few strokes, add the lemon essence and cinnamon. Partially melt the butter and whip it into a light froth. Add the flour to the batter, and commence stirring it in; when about half mixed, add the creamed butter gradually, at the same time continuing the mixing-in of the flour; as soon as the flour appears to be incorporated, turn it gently out into a tin with deep edges, the same as for Genoa cake, and bake in a cool oven. This cake, when cut, resembles sponge cake, is of a rich yellow hue and light texture; it can be served plain, or cut into shapes, with apricot preserve, and ornamented, etc.

Tea Cakes, or Sally Luns.

1 pint milk, 1 pint water, 6 ozs. sugar, ¾ lb. butter, 2 ozs. yeast, 1 oz. "Textis," 3 eggs, and 4½ lbs. flour; ferment the same as for buns, and when the dough is ready, weigh into pieces of ½ lb. or less, mould them round, put them upon tins, with or without hoops around them, prove, and bake.

Balmoral Cake.

1. *Seed.*—This is a good luncheon or tea cake: 2 lbs. butter, 2½ lbs. castor sugar, 2½ lbs. eggs, 6½ lbs. flour, 2 ozs. caraway seeds, 3 pints milk, ¼ lb peel, chopped fine, and 1 oz. powder. Cream butter, sugar, and eggs as for pound cakes, then add peel

ground ginger; mix and bake carefully as for pound cakes. When cold, mask with the palest green fondant, pipe the outer part of top with white icing; group tastefully bright drained or glacé preserved fruit in the centre, and cover the side with finely-chopped pistachio kernels.

Seedless Caraway Cakes.

Take 1 lb. flour, ½ teaspoonful of seedless caraway crystals, ½ lb. butter, 10 ozs. of castor sugar, ½ lb. eggs, ½ gill of milk, and a pinch of baking powder. Butter the cake tin thoroughly first of all, then line it with buttered paper, the buttered side to be next to the cake mixture. Cream the sugar and butter together in a basin––that is to say, work the two ingredients into each other with the hand or wooden spoon, until the mixture is smooth and creamy; then beat one egg in at a time. The flour, caraway powder, and baking powder should be passed through a wire sieve together. Add half of this mixed flour to the mixture in the basin, and stir it well in; then add the other eggs, beating it in the same manner as before, and lastly, the remainder of the flour. Turn this into the prepared cake tin, and bake in a moderate oven.

Aberdeen Cakes.

3 lbs. flour, 2 lbs. butter, 2 lbs. sugar, 1 lb. chopped citron, 1 lb. cut dried cherries, good pinch of nutmeg, and 22 eggs. Cream the butter and sugar in the usual way; add and beat in the eggs, two at a time; mix in the fruit, and then the flour; weigh two pounds into oval or special diamond-shaped frames. When baked, draw the tins off without breaking the collar (which should be of good stiff white paper), and pour enough fondant upon the top to cover it, some pink, some white; place glacé fruits in middle of top, and four opposite diamonds of angelica.

Simnel Cake.

Mixture: 1 lb. butter, 12 ozs. sugar, 10 eggs, 8 ozs. ground almonds, 1 lb. sultanas, 4 ozs. finely-chopped citron, a good pinch each of ground cinnamon and mixed spice, the juice of 3 lemons, and 2 lbs. flour. Cream the butter and sugar in the usual way; add and beat in the eggs; then add the spice, fruit, almonds, and lastly, lemon juice and flour; weigh into size required, and bake in a cool oven. When baked, cover with a thin layer of almond paste, made by mixing castor sugar and ground almonds into a smooth stiff paste with eggs; dust the almond top lightly with castor sugar, and place round the outer edge a border of small crystallised fruit, laying in the interstices of the inside of the border silver dragees; it will be necessary to

fasten the crystallised fruit on with icing sugar. Generally these cakes should be baked in well-papered hoops, with a stiff white paper collar, standing well up, and be sent out with the collar on, or in its place a frill or silvered paper. The Simnel is an old-fashioned cake, consequently currants are freely used in it; but currants do not suit the taste of good class buyers, and therefore sultanas are substituted, a fruit always in favour.

The Discoloration of Iced Cakes.

The ripening of cakes, like the ripening of fruits after picking, is a process of natural decomposition. The moisture inside the cake, and the "life in the air" outside, act upon the saccharine matters and set up a species of ferment, which degrade the other constituents; and as the decomposition becomes general and active, it attacks any porous or soluble matter with which it is in contact. Up to a certain stage, this ripening is good, and in fruity cakes necessary. To arrest this ripening, blending, or decomposition is to mar the flavour and perfection of the cake. As in "pickling" eggs and preserving provisions, the arresting by chemical means of the natural law usually result in loss, or partial loss of flavour and bouquet. When it is necessary to store iced cakes, the cakes should be iced as soon as it is thoroughly cold, before the air—or what is commonly called air—interferes with it and sets up this decay. In the case of bride cakes, if the almond icing were brought down over the side of the cake, that would lengthen the time before the juice would attack the icing sugar. To prevent this entirely, some insoluble matter that is less subject to natural decay must be interposed between cake and sugar. It is a great preservative to the outer icing sugar to wash or varnish the cake with a solution of gum or gelatine, with lemon juice or proof spirit; brush it over the cake, and let it dry; when iced, keep in a dry place.

Cake Ornamentation—Icing and Piping

To learners in icing and piping, I would recommend the following plan; it will make very good practice, and is at the same time cheap and convenient: Get some firm lard and work it up lightly with a little flour, and then with the ordinary icing pipes or paper tubes ornament a cake tin, turned bottom upwards; it can be scraped off and used again and again. It is not always possible to get practice with real cakes and sugar, and practice you must have; for if ever the old adage was true that "Practice makes perfect," it is so in this case. Icing pipes are sold by most confectioners' toolmakers from sixpence each, bags and nozzles ninepence to a shilling, though paper in the hands of our artistes in sugar can be made to accomplish great

things; but to make the larger stars, etc., pipes are indispensable. To make paper tubes or pipes, use good paper—a special paper is sold for the purpose, and is very good; cut through a small square from corner to corner to form a triangle shape; fold this up in the form of a cone, like the small sugar paper "cups" the grocer puts the sugar in; fold it to a fine point, and cut the point off according to the size of the tube you wish to use; put the tube and icing in; fold down the mouth when the icing is put in, to prevent it squeezing out when the paper is pressed. Use the thumb on the top to press the sugar out, and not the guiding fingers at the bottom. Keep the fingers and tubes clean, but do not lick them with tongue. Use a wet cloth for this purpose.

To ice Cakes.

1 lb. of icing sugar, whites of 3 eggs (during the time when eggs are dear icing powder is a cheap and good substitute for whites of eggs, or if in such a fix that neither of them can be obtained, slowly dissolve ½ oz. of gelatine or isinglass in a gill of water, and when quite dissolved, add a pinch of tartaric acid, or 4 drops of acetic acid, and beat in the sugar in the usual way until stiff enough); put in a clean dry basin, and beat until it stands in any given shape (about ten minutes will do this); it will then be ready for use. If required coloured, the colouring must be beaten into it. Put upon the top of the cake as much sugar as will cover it all over, or only the top as desired, and with a palette knife large enough to cover the diameter of the top, work it from side to side (Fig. 1), always keeping one side of the knife upon the sugar. Do not take it off or turn over, or scrape the cake. After the top is well and evenly covered, draw the knife off with one sweep. Usually the first attempt at icing leaves the surface a little rough; lift the cake and knock it gently upon the table, which will cause some of the ridges left by the knife to fill up; and if the sides are to be sugared also, let the sugar run over, and put the knife round once roughly to cover the cake, and then give one even sweep right round the cake (Fig. 2). Do not take the knife off until the whole circle is made, or it will show the mark. The knife should not be flat upon the side of cake, but slanting, so that it will carry the excess sugar before it right off at the finish of the stroke; put a frill of white tissue-paper round the side, and one of pink, a little narrower, over it, so that the white shows a little above and below the pink, or decorate with pipes or sugar. Ornament the top with twelfth-cake ornaments, or the ornaments desired according to the use to which the cake is to be put. Wedding cakes should be all white; birthday, christening, or other table cakes should be coloured. Don't make the colours too

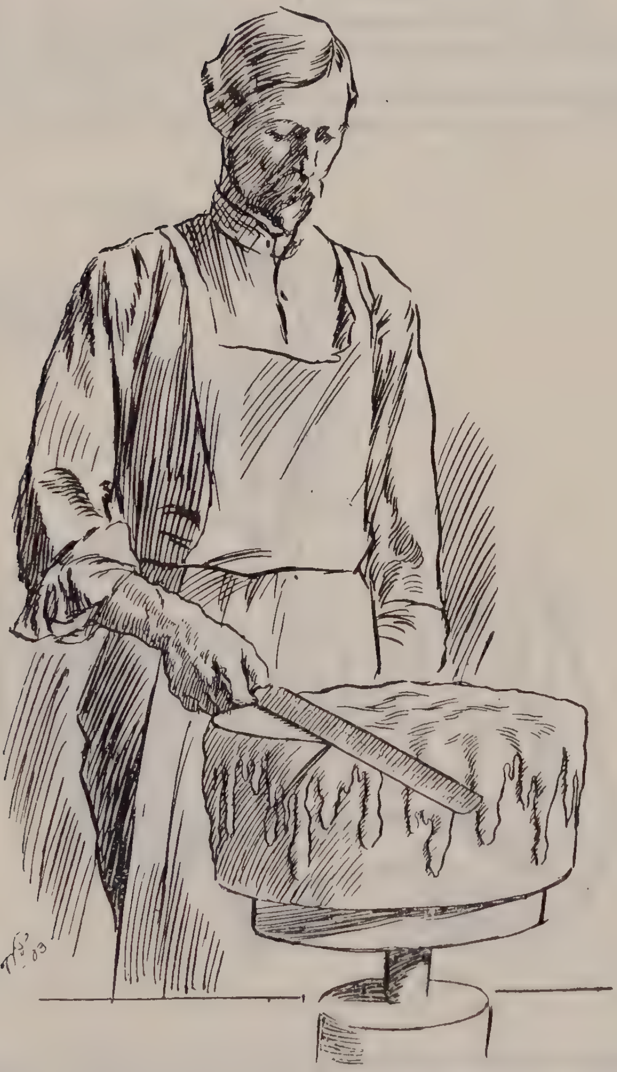


FIG. 1. (*See page* 117.)

glaring and deep, but delicately tinted. Use pipes thus (Fig. 3), or use the thread pipe as you would a writing pencil. A modern and much nicer form of ornamentation is to glaze with fondant sugar, and then decorate with glacé fruits, angelica, etc. Royal icing to eat is an abomination.

When *icing* cakes, use a cake turn-table having a small base with swivel, upon which a large circular table, about 9 inches in diameter, is fastened. The cake is placed upon this, and is turned round as the operator wishes. If not come-at-able, use a round cake-tin turned bottom upwards; it should be slightly smaller than the cake to be iced, to allow the knife to go round the side.

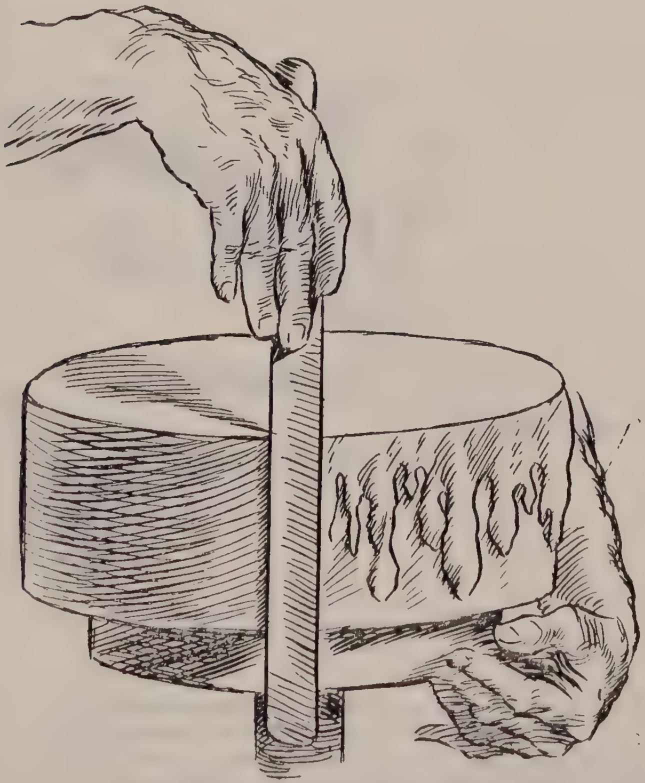


FIG. 2. (*See page* 117.)

Colouring for Cakes.

For red or pink, carmine or cochineal.—To prepare cochineal, boil for five minutes ½ oz. cochineal powdered, with ½ pint cold water, ¼ oz. alum, 1 oz. sugar; take off fire, throw in ¼ oz. cream of tartar; stir well; when cold, bottle and cork for future use. For green, either pound spinach leaves, press out juice, and boil a minute before bottling to preserve it, or put them in a little water (to keep from burning), and boil until soft, rub them through a fine sieve, and bottle for use. For brown, boil 2 ozs. sugar just moistened with water; keep stirring, and as soon as it begins to colour, draw on one side, and let it slowly brown and dry (about an hour); when nearly black (but do not burn), put in a bottle, and cork. When required, moisten with hot water, if dry. Chocolate, melted, will also make a nice brown. Colourings, flavourings, or essences can be obtained in paste and powder cheaply, and in great variety, and are much brighter and better for the purpose.

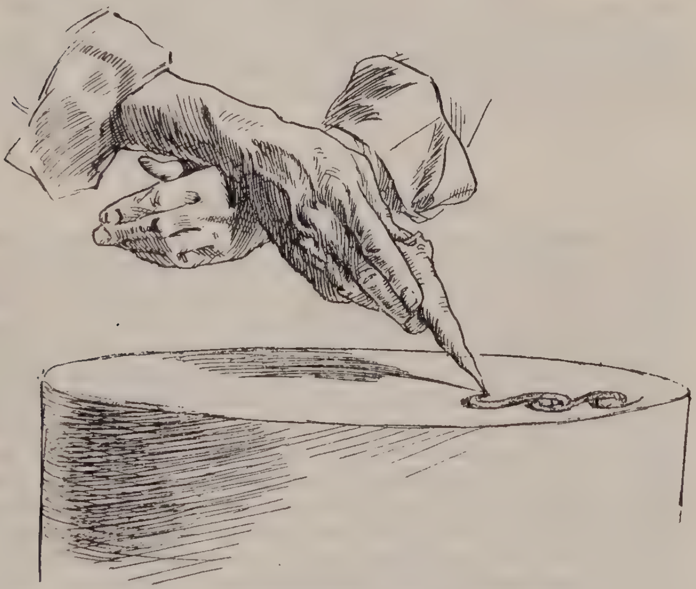


FIG. 3. (*See page* 119.)

Almond Icing for Bride Cakes.

½ lb. ground sweet almonds, 1 lb. sugar; mix them, and make them hot in the oven; then mix them into firm paste with eggs, and put upon top of cake quite smooth; let it dry for a few hours before putting on sugar icing. If made firm, it will be dry enough to put the white icing on as soon as done; roll it with a rolling-pin the size of the top of the cake; lay on and level with rolling-pin; also lay the rolling-pin perpendicular against the side, roll it round the cake; this will square up the rough edges.

Pink dry sugar for ornamenting is made by dropping a few drops of carmine upon sifted loaf-sugar dust or large crystals, and rubbing it between the hands until the colour is evenly distributed, and deep as desired; then dry it. Use the sugar either coarse or fine, to suit work.

PASTE AND PASTRY.

There are several modern recipes for paste and pastry. The baker has vied with the cook to produce something novel, and many modern recipes are here given. There is the old puff paste, for which I will give the three or four standard recipes. There is also the plain short paste with and without sugar, which is used for lining patty-pans or tart dishes, where it is necessary that the paste should retain its shape and not puff up, so that the filling that is placed in them may not be displaced in the oven; and therefore throughout the recipes for cheese cakes, custards, etc., requiring a passive crust, I will merely say short paste, leaving it to the taste of the workers to make any variations they think fit, not forgetting that puff paste, after it has been rolled and cut out twice or thrice, ceases to puff, and has become short, and is therefore a very useful short crust for ordinary purposes where the demands of the trade are small; the cuttings rolled up and pinned out (allowing a minute or two for the paste to recover its pliability) will do very well. *About the various fillings*, cheese cakes, etc., it will be needful also to say a few words to save a great deal of rewriting in different quantities of the same mixture. The new fillings are really, in the majority of cases, simply good cake mixtures called by all sorts of fanciful names, the recipes for which would take up more space than we can afford. Nor is it necessary that they should be given; most persons with average intelligence will be able to grasp the principle of their make-up when I say that a good Madeira mixture, light and rich, or even weights of butter, sugar, eggs, and flour, with a pinch of baking powder mixed as for pound cakes, is the filling of these

goods. These cake mixtures form good bases upon which to build a number of nice things, by adding flavourings, ground almonds, etc. *In the directions for puff paste* I have only spoken of the use of butters for the purpose, but that is not from any prejudice against the use of margarine and other mixtures; on the contrary, given that the mixture is of first quality, and made specially for puff paste making, I would always prefer to use it in place of the sloppy salt stuff or the foreign rank stuff that is sold as pure butter.

Puff Paste.

Use equal quantities of butter and flour, and mix as here directed. Take an eighth part of the butter and rub it into the whole of the flour, using enough cold water, with a pinch of cream of tartar in it, to make this into a soft dough; press this dough out, dust with flour, and fold it up several times, until it is tough and springy; let it stand for two or three minutes to become pliable, and then with the rolling-pin roll it out to about a quarter of an inch thick, keeping the sides and ends as square and straight as possible; then roll the remainder of the butter into a square flat piece, not quite so large as the paste (about two-thirds), lightly dust it with flour, and lay it upon the dough; fold the uncovered part of the dough over the butter, so as to completely envelop it. Now dust the board with flour, lay the paste upon it, lay the rolling-pin upon the paste, and lightly roll it backwards, forwards, and crossways, until the paste is about a quarter of an inch thick, or thin enough to fold up easily without breaking the outer skin of the dough; press the rolling-pin evenly upon the paste, and do not jerk, drag, pull the paste, or allow the butter to break through and stick to the board or pin. When rolled enough, bring the two opposite ends over to meet each other upon the top and in the middle of the paste; lightly dust and roll out and fold again in the same manner; dust with flour, cover with a cloth, and put away in a cold place for an hour to allow the butter to become firm and the dough pliable. Then flour the board, roll out and fold again; this will make the third folding. Repeat these foldings and rollings three times more, making six in all. The paste is now ready for use, viz., for cutting into tartlets, *vol-au-vents*, etc., and all pastry that is required to be very light and flaky. Cut with a sharp cutter, and do not touch the edge when picking up or washing over. After the paste has received the sixth roll out, it will, upon further rolling, become less flaky, and be more suitable for fruit-tarts, etc.

The foregoing directions for pastry-making will meet all

ordinary needs; but there are certain points, such as the use of soft butter and the extreme fluctuations of temperature, that have so much to do with the making of good puff paste that a few explanatory remarks are absolutely necessary to guard the learner against those frequent failures and disappointments which inevitably follow upon carelessness or want of knowledge. For instance, sometimes the summer is intensely hot, often reaching 105°, and all ordinary instructions would, in such circumstances, be insufficient to enable people to turn out goods in a workmanlike manner. Butter is reduced to a state bordering upon oil, and everything depends upon the care with which the butter is prepared beforehand, the gentle handling, lightness of touch, and the rapidity with which the paste is worked off. This extreme heat being followed by a sharp bout of severe frost, all the previous conditions are naturally reversed, the hard, frozen butter has to be well worked down, and the paste to receive more rolling. We give a few precepts about the preparation of butter, the use of ice, and the cause of "tough," "short," or "flinty" pastry:

In Hot Weather

choose a good quality butter, without moisture or loose salt, or a good mixture of fats; have it cut into a square piece direct from the tub, or package, and do not handle or pat it. Put it into the refrigerator; failing a refrigerator, place it upon ice or iced water. When the butter is set firm, dust with flour; put upon a board, and flatten it out to the size required to be covered by paste; put it away again upon a board until it is firm and ready for use. When the butter is firm, wet up the flour with iced water with a pinch of cream of tartar in it, and mix as directed; be careful to keep the paste from sticking. If there are signs of the butter coming through, only fold and roll one fold at a time, and put the paste away near ice for a few minutes each time, until the six foldings are completed. When the butter is soft and weak, ice should always be used; but if firm, and weather cold, it will not be necessary.

The cause of tough, flinty pastry is insufficient rolling. The butter, if firm and hard, will, unless well rolled in, remain in layers, and when the paste is put into the oven, these layers will lift the paste and cause it to be flaky; but the butter, not having been thoroughly incorporated with the flour, will be liberated by the heat of the oven—in other words, boil out. This will cause the paste to be flinty, and although flaky while hot, it will, when cold and exposed to the air, become tough. In hot weather the converse is the case. The butter is soft, and easily amalgamates with the flour, and the resulting pastry is short and rich. When

the butter is in this condition, great care will make the best of it; but if used in its soft state, it is impossible to make satisfactory light goods from it. More or less rolling is of little consequence; the great point to be observed is the preparation of the butter some time before using—the day before, if possible.

You may not always be able to obtain ice in summer; if not, use cold spring water, or as cold as you can get it, and put an ounce of saltpetre in it, and stand the butter in that overnight. In very cold weather the butter will be ordinarily very hard, and if put upon the paste in that state will break through; to make it workable, put it upon the pasteboard, and work it down slightly, but do not make it too soft. If the butter is salt as well as firm, work it down in a pail of water and well wash it. After handling, make into the size required, and put away for an hour or so to recover its tenacity. If you are making a large piece of paste, when finished rolling lay it by, cover with a cloth, and cut from it as required. Some makers prefer not giving the last fold to the whole piece, but cut a piece from the bulk, roll it out, and fold each piece. There is this advantage: you can thus make your pieces flaky, or partly so, or solid, as you may need, for the kind of tarts, tartlets, patties, etc. Tartlets, to prevent waste, should be cut out in two pieces. Roll the paste half the usual thickness, cut out two pieces, stamp the middle out of one of them with a smaller cutter, and lay it upon the top of the other, having washed over the under one to make them stick together. When you wash pastry, be careful not to wash the edge, as it spoils the appearance, besides preventing the proper rising. In pastry, when the middle has to come out, cut or mark the piece to be taken out with a cutter, dock the piece with a skewer, knife, or fork, and when baked remove it by first running a penknife round it, then lift it up. Use as hot an oven in the baking as possible, without burning or undue colouration.

In the baking of pastry, the heat of the oven should be regulated according to the article intended to be baked. Light paste requires a moderately quick oven. If the oven be too hot, the articles will be coloured, or appear to be done, before they are baked enough; and if then taken out of the oven, instead of retaining their puffed-up appearance, they immediately fall and become flat. On the contrary, a cool oven will prevent them rising to the proper extent, and having a nice colour. Tarts or puffs that are iced (or washed over with egg, and powdered sugar dredged over them, and then sprinkled with water) require a cooler oven than those that are not iced, for the oven if too hot will scorch or catch the icing, and discolour the goods. Leaving the oven door open will sometimes remedy this evil, but the

goods should not be too near the mouth of the oven in this case. Pastry, when soaked or baked sufficiently, can be handled or slid about the baking-tins, or lifted from the patty-pans without breaking, if properly and sufficiently baked.

To ice Tarts and Pastry, etc.

Make a wash with two whites of eggs to ¼ pint of water. Put the whites into the water, and then whisk it; if the whites are whisked before going into the water, they will not mix freely, but will settle as a froth upon the top of the water. Dip a paste-brush into this liquid, and lightly wash over the pastry; then thickly dredge over it some castor sugar, and sprinkle with the wash. Do not put on too much wash, or it may run off and disfigure the goods. If the dredging, etc., is carefully managed, a thick coating of frosted or glazed sugar will be produced. If the sugar is put on thin, the heat of the oven will quickly melt and brown it, giving it the semblance of a varnish. Therefore, according to the desired appearance of the goods should be apportioned the quantity of added sugar.

The question whether to ice pastry before or after putting into the oven is dependent upon the size and weight of the article to be baked and the heat of the oven it is baked in. If the pastry is small, and the oven not too hot, then, as in the case of Coventrys and articles of that size, they can be iced before transference to the oven. But care is always necessary in baking pastry that has been iced previously, because the sugar browns and burns very easily. If the oven be cool, fruit pies may likewise be sugared before going in; but with a hot oven, large pastry or pies should be partially baked before icing. In the latter case, if the articles be taken out before the pastry is set, there will be danger of its collapsing and becoming heavy. Allow the paste to become set before moving.

A very nice icing is made by whipping whites of eggs to a froth, and with a brush laying it over the paste, which is then to be covered thickly with sugar and sprinkled with water.

To make a Vol-au-vent.

As soon as the puff has received the last turn, roll it out to about half an inch in thickness, and then with the *vol-au-vent* cutter cut out a single piece. Roll out the remainder much thinner, and with the same cutter stamp out a piece to form a bottom; then with a cutter about half the size of the first one stamp the middle out of the thickest piece cut out first, slightly damp the thin bottom piece, and put the large oval ring upon it, carefully fitting it all round. When it is properly attached, place

upon a baking-tin, and bake in a good sound oven. The piece that was cut out from the top should be rolled a little flatter or thinner, washed over, and some folded leaves or other paste ornaments put upon the top, and baked. This will do for a cover for the *vol-au-vent.*

(2) Puff Paste.

1½ lbs. flour, 1 lb. butter, ½ oz. cream of tartar, ¼ oz. carbonate of soda. Put the cream, soda, and about 2 ozs. of butter, rub them well together, and make a bay; add enough water to make a light springy paste, make it as tough as possible; let it lie five minutes to recover, and then add the butter, and work off as before directed.

French Puff Paste

is made by adding 3 or 4 yolks of eggs to 1 lb. butter, 1 lb. flour. The yolks are added with the water, and made into a light dough, and rolled out as usual.

Short Paste.

Rub ½ lb. or ¾ lb. butter into 1 lb. flour; wet into a pliable paste with water, and work down quite smooth.

Sweet Short Paste.

This paste is used for fruit and other sweet goods: 1 lb. flour, 2 eggs, ¾ lb. butter, 2 ozs. sugar, mixed into paste with water, and rubbed down as before.

Short Paste for Raised Pie-cases.

If the case is merely to hold the mixture, and not to be eaten, make it very plain, because the plainer the paste the better it will stand up. In such case, dissolve ¼ lb. of lard in ½ pint of boiling water, and stir in with a wooden spoon as much flour as will make it into a hard paste (about 1 lb. 2 ozs. of flour). Thoroughly knead it so that it resembles a smooth, hard biscuit dough; then mould it into the shape of a sugar-loaf or cone, and put the palm of the left hand at the side of the bottom of this cone, and with the right hand press the top downwards; keep working the knuckles of the right hand downwards, and at the same time work up the sides all round with the left hand. Continue this until the box, so to speak, is deep enough, pressing the right hand about inside, and sustaining the sides with the left, and working it upwards at the same time. When the case is raised enough, put it away to harden; after which wash the sides with yolk of egg. Ornament with leaves and other designs cut from the same paste, fasten on securely with egg, and put away to harden. Cut the lid out, wash and ornament, etc. If the worker does not make a nice shape by the foregoing plan, then

roll the paste out with a rolling-pin, cut out the bottom to the size required, also a band high enough and long enough to go all round the bottom; wash the bottom with egg to make it stick, and stand the band on it; bevel off the two ends, and join them securely and neatly. Be sure and fasten to the bottom securely, or the gravy will run out; wash with egg, and ornament as before. If the paste is for eating, use ½ lb. of butter to 1 lb. of flour.

Beef Patties.

Cut up lean beef quite fine, take out all the skin and sinew, chop a little fat with it, mince a very small onion, and a little parsley, pepper and salt sparingly, mix a tablespoonful of suitable sauce, with enough water to make gravy, and put the meat into it before putting it into patty-pans; make puff paste, cut out the tops first, and then use the cuttings or some short paste to line the bottom of the patty-pan; put the meat in quite moist with water and sauce, put the tops on, fasten them down all round by gently pressing the outer edge; wash over with yolk of egg; cut out some paste leaves from the cuttings, stick them on top, and thoroughly bake in a sound oven; garnish with parsley.

Chicken Pie for Picnics.

Cut two large chickens into neat joints, put all the trimmings and bones, etc., into a stewpan, a little pepper and salt, an onion, piece of mace, and a few herbs; cover with water or "stock," let this simmer two hours to make gravy; make a forcemeat of the liver, a slice or two of tongue, ¼ lb. ham, and the yolks of 4 eggs; season with salt and cayenne pepper, and make into balls; place a layer of chicken in the bottom of the dish, over this a layer of ham. Place the forcemeat-balls amongst the meat, strew over them some chopped mushrooms (or truffles, if wanted extra good), pour in the gravy, and cover with good puff paste, and finish in the usual way. If quantity and economy are required, add 3 or 4 hard-boiled eggs, and put in sausage meat instead of the forcemeat.

Venison Tartlets.

If there is a little cold venison left, it may be hashed, and hashed venison is, of course, a great and well-known favourite. But if this has been done, and a change is required, the following will yield a nice little cold entrée: Mince the venison and make it into a venison *salpicon* as for *croquettes*; fill some puff paste tartlet cases with this; when cold, pipe a rim of red currant jelly round the edge, and a button of the same in the centre on the venison. Serve cold, with a little chopped aspic over the surface. For use at luncheons or picnics.

Sausage Rolls.

Roll puff paste very thin, and cut out in pieces $3\frac{1}{2}$ by $3\frac{1}{2}$ ins., lay sausage meat made into a roll about the size of your largest finger through the middle; damp the edges, and bring the paste over the meat to join the other side; wash over with yolk of egg; ornament them with cut paste leaves, or cut them with a knife two or three times through the thick part slantwise. Sausage meat is usually obtainable from the pork butcher; but if you prefer to make it, the following recipe may be recommended: 1 lb. pork (fat and lean), 1 lb. lean veal, $\frac{1}{4}$ lb. suet, $\frac{1}{2}$ lb. bread-crumbs, five sage leaves, $\frac{1}{2}$ teaspoonful of pepper, 1 of salt, and $\frac{1}{2}$ of marjoram. Be careful that the meat is free from skin and sinew; chop very finely, add the bread-crumbs and seasoning, and mix well together.

Oyster Patties.

Cut some pieces from puff paste as for tartlet cases, wash them over with yolk of egg, and bake carefully. Cut out a smaller piece, wash over with egg; put a paste leaf upon it, and bake: this will be for the cover. To make the paste leaves, cut out some short paste; pinch one end between the thumb and finger of the left hand; lay the back of the knife down the middle, and then crimp it on each side of the line in a slanting direction; fill them with the following preparation:

To prepare Oysters for Patties.

1 oyster for each patty-case; warm them in their own liquor; be careful not to boil. Strain and beard them. Make a sauce as for melted butter, only with the liquor from the oysters; season; add a little cream; put back in the stewpan. Keep all warm till required; then put 1 oyster in each case; fill with the sauce; put cover on; send out with parsley garnishing.

Pastry Cheese Straws.

Mix 2 ozs. grated Parmesan cheese, 2 ozs. old and dry ditto, 4 ozs. butter, 6 ozs. flour, 2 yolks of eggs (flavour with cayenne, salt, and a little powdered mace) into a stiff paste, roll out $\frac{1}{4}$ inch thick; cut this into fingers three inches long, the same width as thickness; bake quickly.

(1) Cheese Cake Mixtures.

$\frac{1}{2}$ lb. sugar, $\frac{1}{2}$ lb. butter, $\frac{1}{4}$ lb. ground almonds, 5 eggs, $\frac{1}{2}$ lb. flour, 1 oz. powder; cream and mix as for cakes.

(2) Cheese Cake Mixture (called by the Trade "Cheese Curd").

½ lb. stale sponge cake rubbed through a sieve, 6 ozs. castor sugar, ½ lb. butter, 3 eggs, 4 yolks, ¼ lb. potatoes boiled and mashed, a little grated lemon rind, and 4 drops essence of lemon. Cream the butter, sugar, and eggs the same as for cakes, then stir in the mashed potatoes, flavourings, and sponge-cake powder, and, if preferred, 2 ozs. ground almonds. This mixture should be used up in a few days, and should be kept in a basin or pan for use.

Common Curd.

¾ lb. flour, 6 ozs. sugar, ¼ lb. margarine, 1 oz. powder, essence of lemon; rub all fine together; wet up with water.

(3) Cheese Cakes.

Cut from puff paste that has had an extra turn, or from the cuttings left from tartlets, some circular or oval pieces with a fluted cutter, the size of the patty-pan it is to be baked in; press the middle out a little thinner than the sides, to prevent the bottom from rising up and displacing the cheese curd during the baking. Place this in a patty-pan, and put a piece of cheese curd in the middle of the pastry, and bake in a sound oven. If, when baked, the cheese curd is found to be too firm or dry, beat up ½ egg and 1 oz. of butter, and add it to the curd to make it lighter; if it should be too soft, and run over the paste, add 1 oz. more sponge cake to the mixture to stiffen it.

(4) Cheese Curd.

Turn 4 quarts of milk with rennet or lemon juice, or a pinch tartaric acid, drain off water, beat the curd up with ½ lb. soft butter, and 4 yolks, ¼ lb. fine biscuit powder or 3 ozs. powdered sponge cake, the rind of 3 lemons, the juice of 1 lemon, 6 ozs. sugar; beat until creamed, and use a spoonful in short paste in the ordinary way.

Cadogans.

Cut out paste as for cheese cakes, place in deep patty-pans and into each of them put a tablespoonful of the following, preparation: Break up fine, in a pan, ¼ lb. stale macaroons or any kind of almond goods, add ¼ lb. castor sugar, 2 eggs and 2 yolks, 2 ozs. butter slightly melted, 2 ozs. candied orange-peel cut *very* fine. Beat this mixture with a wooden spoon for several minutes, and use a tablespoonful as directed above. When in the pastry-cases dredge some fine sugar over them, sprinkle with water, and bake the same as for Coventrys.

French Congress Tarts.

¾ lb. ground almonds, 1½ lbs. sugar, made into a soft paste with white of egg; beat this with a wooden spoon for a quarter of an hour, line some patty-pans with paste, place a piece of apricot or greengage jam (about the size of a walnut) in the bottom, then upon the top of this put a teaspoonful or more of the almond batter; give puff-paste cuttings an extra turn or two, and cut into narrow strips about an inch long; lay these in the form of a star, or across each other on the top, and bake.

Almond or German Cheese Cakes.

½ lb. ground sweet almonds, ¼ lb. sugar, 2 eggs, 4 yolks ditto, a pinch of powdered mace, a little grated lemon peel, and 6 ozs. melted butter. Beat the eggs, sugar, almonds, and spice together in a basin with a wooden spoon for ten minutes, melt the butter, mix all together, and put a tablespoonful of the mixture into patty-pans lined with puff paste; before putting them into the oven, put a small piece of fresh butter on each.

Vanilla Sandwiches.

Make two long strips of puff cuttings about three inches wide, and rolled very thin; prick and bake. Prepare a custard with 2 ozs. cornflour, 4 eggs, 1 pint milk, 3 ozs. sugar, and essence of vanilla. When cooked, spread this on the baked pastry slices; cut in fingers, and ice over top, using water icing or fondant.

Almond Tart.

½ lb. ground sweet almonds, 10 yolks, a pinch each of ground cinnamon and ginger, ¼ lb. sugar, 1 pint of milk, and ½ lb. Savoy finger biscuits. Beat the yolks and stir them over the fire until they thicken, then mix all the other ingredients, and put into pastry-lined pans (one or more), and bake in a moderate oven. When baked, stick shredded Jordan almonds on the top.

Apple Tartlets.

Pare and core 12 apples, put them into a stewpan with a gill of water, ¼ lb. sugar, and the juice of a lemon. When sufficiently done, cut out ordinary tartlet cases, or a large-sized rather narrow oval dish, fill with the apple, and bake in a fairly hot oven. Boil down the liquor the apples were stewed in to a thin jelly, and when the tartlets are baked, pour some of the syrup over them, then sift castor sugar on them, and place a dried cherry on the top of each tartlet.

Apple Tart (Open).

Line a flat or shallow oval dish with puff paste cuttings rolled out thin, prepare some apple pulp by boiling apples in sugar or syrup, flavoured with cloves, and spread this about half an inch thick on the paste. Cut very thin strips of paste, twist them slightly, and lay them in cross-bars over the tart; bake in a good sound oven. Prior to baking blanch a few almonds, cut them in long strips, and place them on the top of the tart.

Fried Puffs or Cannelons.

Roll out some puff paste into a thin sheet, cut it into strips about two inches by six. Spread these with jam or freshly stewed fruit; wet the outer edges, roll up lengthwise rather loosely, and fry in boiling fat; after a minute or two draw the pan on one side of the fire to finish the puffs, or they will brown too much; drain them upon thin paper, etc.

Fanchonettes.

There is no reason why the "Fanchonette," as used at dinner-parties, should not make a good article for first-class shop sale. The great majority of my readers know what a "Fanchonette" is; but a few do not. It is a tartlet baked with a little jam in the bottom, and a little stiff-cooked custard or cheese cake mixture over the jam. When baked, they are masked for half an inch or more with meringue, and piped on the surface with some of the same material as decoration; then dredged with pulverised sugar, and dried in the hot closet or very cool oven, as for spoon meringues. The best plan to adopt for shop work would be to make "fanchonette tops," and keep a stock of them in tin boxes, making from day to day what tartlets you require, and sticking the tops on with a little icing. The tops can be piped on to slips of foolscap paper, or tins previously greased and floured, so that they will slip off easily when baked and cool.

Scotch Cheese Cakes.

Line patty-pans with a short crust, fill with cheese cake mixture No. 1; place 2 strips of paste in the form of a cross on top of each; bake in a warm oven.

Strawberry Tartlets.

Cut out some sweet short paste, place in patty-pans, bake in a moderate oven, of a golden colour. Then put into a clean stewpan 1 lb. castor sugar, the juice of 1 lemon, and ½ pint water; place this over a clear fire, let it boil to a syrup; have ready 1 quart of strawberries, place these into the syrup, simmer, *not boil*,

for a few moments; then put three or four of the strawberries into each shell, reduce the syrup a little, and place a spoonful over the fruit in each tart; colour syrup with carmine.

Banbury Cakes.

Cut out puff paste into flat oblong pieces, and put this mixture into them: Take 12 ozs. of butter, *cream*, add 12 ozs. sugar, 6 eggs by degrees, a little grated nutmeg, 1¼ lbs. currants, 4 ozs. of finely chopped lemon peel, ½ lb. flour, and 2 ozs. stale sponge cake grated very finely; mix thoroughly, and fill; make of an oblong shape, place close together on your paste slab, sugar over with fine sugar, and bake in a moderate oven.

Eccles Cakes.

These are generally made from the scraps or cuttings of puff paste. Roll out as for Banbury; cut out with a smaller cutter; mix together 1½ lbs. currants, well cleaned, and ½ lb. brown raw sugar, a little ground nutmeg, and 2 ozs. finely chopped lemon-peel. Place a little of the mixture on each piece of paste, fold up in a round shape, roll out round, say 3 inches in diameter, sugar over, and bake in a moderate oven.

Brandy-bread Tartlets.

Beat up 2 yolks and 5 eggs, dissolve 6 ozs. butter in a pint of milk, and pour it hot over 1 lb. bread-crumbs; when cold, pour in the eggs, add ½ lb. sugar, ½ lb. sultanas, a few gratings of nutmeg, and a glass of brandy; line patty-pans with puff paste cuttings, put in a spoonful of the mixture, and bake in a good oven.

Chocolate Tarts.

Prepare a custard of 2 ozs. chocolate, a pinch of cinnamon powder, 2 ozs. finely chopped lemon-peel, ¼ lb. sugar, 2 ozs. ground rice, 1 pint milk, and five eggs; beat the eggs, and steadily mix all the ingredients together, and stir over the fire until it thickens as an ordinary custard, but do not let it boil or curdle; let it cool, and then pour into patty-pans lined with puff paste; bake in a sound oven.

Tart "De Moi."

Line a tart-mould with a rim of light puff paste, then fill it with alternate layers of grated biscuit or macaroons, shred marrow or veal suet, and different kinds of sweetmeats, until your dish is sufficiently filled. Then boil a quart of new milk, a lump of butter, a tablespoonful of sugar, and a dessert spoonful of rose water; thicken it with 4 well-beaten eggs, pour it into your pie-dish, and bake well.

Fancy Custards.

Line a patty-pan with the cuttings of puff paste or good short crust, place a teaspoonful of jam in them, and a teaspoonful of custard over it, bake in a good oven; when cold, ice with water icing, or an icing made with 1 white of egg to 1 oz. sugar; spread this over the top of the custard; sift fine sugar over it, and put inside the oven for one minute to set.

Pastry Sandwiches—"Straws."

These are cut from puff paste, in fingers about half an inch square and three inches long; they are laid upon tins, with the cut sides forming the top and bottom; the effect of this is that, instead of rising upwards when exposed to the heat of the oven, they spread out flat upon the tin. When baked, spread them with apricot, greengage, or any kind of preserve; place them in pairs, and then ice them with water ice, prepared thus: 2 whites of eggs, 2 tablespoonfuls of water, and enough icing-sugar to make it into a thick syrup. Cover the top of the sandwich with this, and put into the oven to set firm, but do not allow it to discolour. Another way; before placing the paste in oven, give one half a slight twist, and when baked lay this as top half, dust over with sugar.

Pair Pastry.

When cutting out puff paste, cut a certain portion into small oblong squares; after washing as usual with egg, place two small dummies side by side on each piece of paste. Bake as usual; remove the dummies; this will leave two little wells side by side in the paste; fill one well with cooked custard cream, and the other with strawberry jam. This will give a pretty pastry combining both strawberry and cream, to sell in a shop or restaurant at either 1*d.* or 2*d.*; but if the latter, cut the paste a little thicker, and perhaps pipe a thin, neat ring of icing round each well.

Apricot Tartlets.

These are very stylish in appearance, while they eat as good as they look. Prepare the cases as for strawberries, etc., and put a half apricot that has been immersed in boiling syrup into each tartlet, then pipe a rim of red-currant jelly round each tartlet. If for dinner-parties, etc., the apricots and juice can be turned into a basin, kept on ice in the refrigerator, and put into the tartlet cases just before serving, when they will eat deliciously cold.

French Apricot Tart.

Roll puff paste thin, then cut out a piece the size of a plate; lay this on a clean baking-tin; wet round the edge with your paste brush, then place round a border one inch wide; ornament round the border a little; dock the paste over with a fork to prevent it from blowing; sugar over with fine sugar, and bake a nice golden colour in a moderate oven. See that it is properly baked; if not, it will fall when taken from the oven. Then take, say, a dozen apricots, not too ripe: cut them in halves, break the stones, and blanch the kernels by placing them in boiling water for a few minutes as you would do almonds; place in a clean stewpan 1 pint cold water, 12 ozs. white sugar, the juice of 1 lemon; and let this come to a simmer to dissolve the sugar; then place in the apricots; let them simmer very slowly for about five minutes. Take them out very carefully on to a dish; reduce the liquor to a thick syrup, then add a wineglassful of sherry; place the apricots very nicely round your tart, filling it all over inside the border; pour the syrup over; place a kernel in between every other apricot, then a crystallised cherry, and ornament the border with a little red jelly. This is a very nice tart.

Orange Tart.

Take 4 sweet oranges, 3 ozs. of loaf sugar, 2 eggs, 1 oz. of butter, 2 slices of plain cake, and a little milk. Butter a pie-dish and lay in the cake previously soaked with milk. Wipe the oranges, and rub the lumps of sugar over the outside of the rind to obtain the aromatic flavour which it yields; then remove all the white peel, and pound the pulp with the sugar, keeping back the pips; add the yolks of the eggs and butter slightly melted, mix thoroughly, and pour over the cake. Whip the whites of eggs to a firm froth, add a little sugar, pile roughly on the top of the orange mixture, and bake in a moderately hot oven to a pale brown colour. Sift a little white sugar over, and serve hot.

Cream Tartlets.

Make ordinary jam tartlets; place 1 teaspoonful of custard on the jam, and on the top of the custard put a small spoonful of meringue mixture (made with 1 oz. of icing sugar to each white of egg according to the quantity required), bake in a moderate oven, add the meringue when the tartlet is baked, then put back for a few minutes to set.

Cherry Tartlets.

Make tartlet cases with either puff or tart paste, keeping them well open during baking with well-rounded dummies. Stone some red cherries without disfiguring them; put them into a stewpan, add (according to judgment) some pulverised sugar, toss them up together to coat the cherries with the sugar, and boil up for two or three minutes, according to quantity. Now strain the juice from the cherries, placing the latter in a basin; replace the juice in the stewpan, colour with cochineal, acidulate with a little lemon-juice, boil up, and while boiling stir in a very small quantity of raw arrowroot or cornflour mixed with cold water, just sufficient to slightly thicken the juice without making arrowroot pudding of it, or letting the use of arrowroot be detected. Pour this over the cherries; when cold, fill the tartlets, and pipe a rim of whipped cream round each.

Small Pastry Custards.

Prepare this mixture, viz.: 1 pint milk, 1 oz. cornflour, 4 eggs, 2 yolks, the rind of 1 lemon, and about ¼ lb. sugar, 3 drops essence of lemon. Boil up milk, cornflour, lemon, and sugar, take out the lemon-rind, whip up the eggs, and stir in slowly. Line some patty-pans with puff-paste cuttings, crimp or notch the outer edge neatly, nearly fill with the custard, grate a little nutmeg on the top, and bake in a moderate oven.

Pigeon Pie for four Persons.

Cut off feet for top of pie. Take 3 fresh pigeons, divide in two from head to tail, mince the livers with parsley, and put inside; then a seasoning of pepper, salt, and a piece of butter; place on the bottom of dish about ¾ lb. good rump steak cut into strips, seasoned and rolled loosely; lay the pigeon upon the steak, and a half of hard-boiled egg between each of them; put a little more seasoning and a piece of butter on the top, pour into the dish ½ pint clean stock; or wanting this, dissolve a little gelatine in extract of beef and water, season, and pour over; line the top part inside and top edge with paste, and put a good thick crust of puff paste, wash over with yolk of egg, make a hole in the top, scald and skin feet (3 or 4), stick in the hole, toes upwards, and bake thoroughly in a moderate oven.

Chelsea Cheese Cakes.

Line patty-pans with puff-paste cuttings; roll smoothly; press and prick the bottom to prevent puffing; put in them a spoonful of the mixture called Chelsea curd, made as follows: 8 eggs,

6 ozs. sugar, 6 ozs. butter, cream as for cakes, flavour with essence of rose, almond, or vanilla ; put this mixture in a saucepan, gently bring to a simmer, but do not let it boil ; stir ; it is then ready for use. When in the pans, put a piece of citron or glacé fruit on top ; dust with fine sugar, and bake.

Genoese Pastry.

½ lb. of castor sugar, ½ lb. butter, ¾ lb. eggs, ½ lb. flour, a small glass of brandy, 3 drops essence of spice, ½ oz. of powder. Put the eggs and sugar into a pan, beat vigorously five or ten minutes ; melt the butter slowly, but not hot, pour it into the eggs and sugar, add brandy and flour, mix gently ; place upon a buttered tin, spread it about a half inch thickness. The edges require blocking with small pieces of wood to prevent them spreading. Bake in a moderately hot oven a rich yellow, and put away in a cool, moist atmosphere ; it will then become soft, ready for cutting with a paste cutter or sharp knife into small circular, oval, leaf-like, diamond, or any other fancy shape. Cut them through, spread with a variety of bright-coloured preserve, place together again, and cover the top with pink and white fondant. This may be ornamented in various ways according to taste : with pistachio, neat strips of jelly and bright dots of an opposite colour ; or meringue mixture, which should be piped upon the shapes ; dust with fine sugar, and dry in the screen. The following is another mode of ornamentation : When barely baked, take it out carefully and wash lightly with egg ; sprinkle with chopped almonds and coarse sugar crystals, and put it back to finish baking ; when cold, cut into shapes.

Genoese paste can also be used for the framework of *gâteaux*, etc., flavoured with lemon or vanilla to taste. This very light mixture is very good for small moulds.

Marbled Genoese.

Make a sheet of Genoese cake ; the next day shave off the upper skin or crust with a sharp knife. Presuming that the cake is one inch in thickness, cut it into strips about three inches in width, place the strips together, split these, and sandwich them together with some dark jam ; now mask the top surface with some white thinly reduced fondant icing, and before it sets, *marble* it over the surface by *veining*, or drawing alternate coloured lines, and then drawing lines across with a wooden skewer, or preferably with a coarse steel tooth comb, as used by grainers, or a piece of stiff cardboard, cut in shape of comb. Now cut it into fingers of about an inch wide. These will keep

for a week, and will sell at a profit for a 1*d*., although 2*d*. may well be charged.

> *Note.*—First, a very soft, pliable icing, and quickly alternate lines of any number of colours; and then a dexterous wrist, making short or long eccentric sweeps with the steel comb, and these colours are intermingled, but as regular and beautiful as are the rays in a rainbow, or as vivid and bold as are the sun tints cast at the beginning of a sunset.

FLOUR CONFECTIONERY, SUGAR CONFECTIONS, AND ICES, etc.

Meringue Bases

are made by whipping the whites of 12 full-sized eggs to a firm snow, and then stirring into it 18 ozs. of fine castor sugar. The whites, when finished beating, should be stiff enough to uphold a large egg when placed up it. If two or three ounces of the sugar is sprinkled in while whipping it will minimise the risk of reducing the stiffness when the remainder of the sugar is stirred in.

Have ready baking sheets nicely greased and then covered in as much flour as will adhere, when the tin is stood endways or upside down. Upon these prepared tins lay out the meringue, in buttons, scrolls, or shapes desired for building up, or in egg shape and size for shells to hold the cream, etc. When run out (from a paper cornet with the point cut off is convenient), dust over with sugar, and then place the tins in an oven or hot chamber, not more than 200° to 220° F. to dry. When dry they will be ready for use. Those intended for shells will require to have the bottom pushed in and smoothed inside with the round part—back—of the spoon, and then put back into the oven to thoroughly dry. The end, greased, of an egg is good for this purpose.

A Boiled Meringue

for ornamenting, garnishing, or imitation whipped cream, is made by boiling sugar and water to 250° F. and then while boiling stirring into the stiff snow of whites. Put 2 lbs. of best loaf sugar and a bare pint of water into a stewpan, place on one side of fire or hot plate until the sugar is dissolved, stirring it occasionally. Then

place on a brisk fire and bring to a rapid boil; as it boils, skim off the scum as it rises. While the sugar is boiling, have the whites of 1¾ lbs. of eggs whisked to a stiff snow as before, and when the boiling sugar registers 250° F. by the thermometer, pour it into the white snow, stirring quickly during the pouring in. As soon as the mass is smooth and homogeneous it is ready for using. Do not stir too much, or it is apt to weaken in stiffness. Add while stirring half teaspoonful of essence vanilla.

Meringue as a Base for Dessert Biscuits.

Take a portion, say ½ lb., and add to it ¼ lb. ground almonds, and ¼ lb. fine white flour; mix the whole into a dough. The composition of the meringue being half whites and half sugar, a ¼ lb. of each in the half pound, the dough will represent equal parts of white of egg, sugar, flour, and almond, and therefore equal parts of these ingredients in any quantity constitute a mixture.

Manipulation will not injure, because toughness, being minus fat, will be its natural state. Roll the dough into a thin sheet, cut out with a round cutter, lay on baking greased sheets and bake quickly, not too much. As soon as taken out of the oven, lift with a thin knife and curl each biscuit round a thin rolling pin or rod. While hot they will be tough and pliable; when cold, hard and crisp. The smaller the roll or scroll, the neater the biscuit.

Another nice biscuit from this meringue base is made by taking away ⅛ of the sugar, and adding ⅛ of fine cocoa powder. Mix the cocoa with the sugar, and when the whites are a stiff snow, stir in the cocoa and sugar in the same way as for meringues. Lay out in thin fingers, buttons, scrolls, etc., from a paper cornet upon prepared tins, dust over very lightly with very fine sugar, and dry as meringue.

Another high-class base for a dessert sweet is composed of 1 part sugar, 1 part flour, 1¼ parts eggs, and ¼ part of cream. If the initial weight is in pounds, this will mean 4 or 5 ozs. of cream. Beat the eggs and sugar as for sponge cakes, and stir in the cream with the flour lightly. Put this mixture into small greased moulds and bake (not overmuch). The mixture can be flavoured to taste, chocolate, coffee, vanilla, or with various liqueurs. Powders should be mixed with the flour, and liquids added to the mixture just a second before finishing beating. When baked, ornament, or serve plain.

Gâteaux

are shapes, designs, built up from a base or foundation of either a sweet or unsweetened short paste, one of the tribe of flavoured, coloured Genoese pastries or meringues, and generally in sections,

sandwiched together with a confection, make up the superstructure. This when complete is usually masked, covered with another variety of confection, and then neatly, artistically ornamented with other confections, jellies, sugars, glacé, and other fruits, etc. Gâteaux, in design, in colour, in flavour and in name, are as various as the ideas and modes of the multitude of cooks and confectioners.

Favourite confections are coffee and chocolate buttons, or crêmes. These are prepared by beating up the freshest of fresh butter with icing sugar, and flavouring with strong coffee essence or chocolate extract. Proportions : ½ lb. of butter to 1¼ lbs. icing sugar, essence to flavour. Stir together to a firm, smooth paste. It should be stiff enough to retain the design in which it has been laid.

Cheap Sweet Biscuits.

Rub together 6 lbs. flour, 4 lbs. white sugar, ¾ lb. non-odorous low priced fat, ½ oz. cream of tartar, ½ oz. bicarbonate of soda, and make into a firm dough with stale separated milk, with which has been mixed egg colouring and essence of lemon flavouring. Cut out with biscuit cutter, place upon greased baking sheets, and bake in oven at a good heat.

From this base a variety of different biscuits can be made by adding either currants, minced lemon peel and almonds, fine desiccated cocoa or other nuts, caraway and other seeds, or by cutting out plain, damping the surface and spreading upon it any of these, either separate or mixed. For machine work the quantities can be increased in ratio. The actual state of firmness of the dough must be governed by the quantity and its mode of manipulation.

Middle Quality Sweet Biscuit Bases.

(1) 2 parts flour, 1 of butter, 1½ castor sugar, ¼ part of eggs, and enough milk to make into a dough.

(2) 2 parts flour, 1¼ butter, 1¼ sugar, ¼ eggs, and enough milk to make into a dough.

Method, the same as for the common variety, and the other remarks also apply to these two sorts of middle quality biscuits.

African Shoots and Fancy Shapes.

½ lb. butter, 1 lb. castor sugar, 1½ lbs. flour, 4 eggs, 6 drops essence of lemon, enough milk to make into a not too firm dough. Cream the butter, sugar, and eggs, as for cakes ; when creamed, add the other ingredients and mix lightly ; it will then be ready for forcing through the shoot, which should be furnished with three or four different designs or slides. Put one

of these designs into the tube, put some of the mixture in, and then with the plug force it through in long strips upon the board; change the design each time until the mixture is used up, and then cut the strips in lengths, and make them into various shapes, fingers, rings, crowns, Prince of Wales' feathers, etc.; place these upon baking tins, and bake in a hot oven. Do not work the mixture about after it is mixed, or it will become tough and difficult to force through the shoot.

Walnuts.

3 lbs. flour, $1\frac{1}{4}$ lbs. sugar, $1\frac{1}{2}$ lbs. butter, 3 eggs, volatile size of a bean, dissolved in milk, enough to make a firm dough. Mix same as for wine biscuits. Fill up the walnut moulds, cut off the loose dough close to the board or mould, knock them out, place upon tins flat side downwards, and bake in a good sound oven. When baked lightly, touch the flat side with white of egg, and stick two halves together.

Walnut and Cocoanut Cream Nuts.

Prepare a cream, *i.e.* fondant, by boiling to the ball, or 240° to 245° F., 12 lbs. of sugar with 2 lbs. glucose, in 4 pints of water, adding no cream of tartar. Boil in the usual manner to the degree given, then remove from the fire; then turn it on your marble or slate; add $\frac{1}{2}$ oz. gum-arabic dissolved in as little water as possible. Now with your spatula work it backward and forward until it assumes a creamy appearance. When creamed enough place it by for use. When you need to use any take what you wish, dissolve it over heat in a suitable vessel, and turn it on your marble, or use from the kettle containing it, as the case requires. You can colour, also flavour it as desired. Have ready the halves of English walnuts, skinned, also have your cream (white) just soft enough to handle or spread with a knife; then take half a walnut, spread on it a little cream, and press on the other half walnut. Press the two together so that the cream is forced beyond the edges of the walnut, then place them away to dry. When dry, crystallise them or not, as you desire. Walnut cream is the same cream with chopped walnuts worked in it, as many as possible in reason, then pressed out in a cake half inch thick, and for sake of appearance both sides covered with a thin layer of pink cream. When the cream is fully set, cut through in quarter inch slices.

Ratafias.

$\frac{1}{2}$ lb. ground sweet almonds, $\frac{1}{2}$ lb. ground bitter ditto, $\frac{1}{4}$ lb. rice flour, $2\frac{1}{4}$ lbs. castor sugar, about 12 whites of eggs. Put this mixture into a pan or basin, and well beat it with a wooden

spoon until it is a light and smooth paste. Place some of this in a forcing bag, and drop small buttons upon smooth paper. Sift fine sugar on them, place the paper on a tin, and bake in a cool oven. When cold, pick them off the paper; it will not be necessary to wet the paper. The quantity and quality of the white of an egg varies according to the freshness of the egg and breed of the fowl. It will therefore be necessary, when making ratafias and macaroons, to try a few before baking the bulk. When the mixture is ready, run a half-dozen out and put into the oven; if they "flow" out too flat in the oven, add a little more almond or a pinch of flour; but if too firm, with a rough surface, add another white and beat for a few minutes. It is usual, when running out almond goods, to use a bag made of a bullock's bladder, with a hole in the point, through which the pipe or tube is pushed and securely tied. The soft mixture penetrates very freely through cloth or canvas, and is unpleasant and wasteful. The bladder, when used, should be scraped, and not washed. The size of the pipe or tube for ratafias should be half an inch, and for macaroons three-quarters of an inch.

Macaroons and Almond Cakes.

2½ lbs. castor sugar, 1 lb. ground sweet almonds, 12 whites of eggs. Prepare the mixture as for ratafias, and when ready run out on wafer-paper placed upon a tin. Blanch some sweet almonds, cut them in slices lengthways, place two pieces upon each macaroon; bake in a cool oven. It is absolutely necessary that wafer-paper be used (it can be eaten with the biscuit), as it is next to impossible to take these biscuits off paper without wetting it, which is likely to spoil them. When the ratafias or macaroons are upon the paper, before going into the oven lightly dust with fine sugar through a wire sieve.

Spanish Macaroons.

1 lb. almonds, 1 lb. sugar, 12 yolks of eggs, ¼ oz. powdered cinnamon, and the grated rind of a lemon; boil the sugar to the blow, that is, until you can blow it through the holes of a perforated spoon in transparent bubbles, etc.; add the almonds, etc., and simmer ten minutes; add the yokes, and stir rapidly until it thickens, then take it off and pour it on to sugar spread upon a board or slab, mould it into small balls, roll in sugar; put upon wafer-paper on tins, and dry.

Almond Raspberry Sandwiches.

Take ½ lb. ground almonds, ½ lb. castor sugar, and ¼ lb. flour, and make into a firm paste with eggs. Break up some stale sponge or other cakes, and make it into a smooth paste with

raspberry jam. Roll the almond paste into a very thin sheet, roll out the raspberry jam paste into a sheet not quite so thin, and place it between the almond paste, so that the latter forms the top and bottom layers; cut this into sandwiches or pieces about 1½ by 3½ inches; bake carefully, merely setting the mixture, and ice pink and white with fondant slightly favoured with essence of raspberry.

Victoria Sandwiches.

1 lb. butter, 1 lb. sugar, 1½ lbs. flour, 12 eggs, half teaspoonful of carbonate of soda and cream of tartar, sifted with the flour. Cream the butter and sugar, adding the eggs and flour as for cakes. Spread this mixture in sandwich tins about one-quarter inch thick, and bake in a sharp oven. When baked, spread with greengage or other preserve; place two layers together, and cut into eight parts. These sandwiches are properly served whole, iced with the usual water icing or fondant, and ornamented with nonpariels and loaf sugar broken small and made pink with cochineal, or glacé fruit and piping.

Shortbread.

1 lb. flour, ½ lb. sugar, ½ lb. butter, 2 eggs, pinch of powder. Rub butter and flour together, give the sugar and eggs a little mixing, put all together and knead well, rubbing it down with the hand upon the table until the whole is a smooth compact mass; break it into sizes required, mould them into shape, flatten out a little, and with the thumb and forefinger "pinch" the edges; place upon a baking sheet, and ornament the tops with designs of neatly-cut lemon peel and caraway comfits. Bake in a sound oven.

Scotch Shortbread (Rich).

3 lbs. flour, 1 lb. sugar, 2 ozs. citron, 2 ozs. almonds (chopped), 2 lbs. butter. Mix as before.

Scotch Shortbread (Plain).

4 lbs. flour 1¾ lbs. butter, 6 ozs. sugar, 1 oz. caraways, 1 oz. powder, and about 4 tablespoonfuls of milk. Rub them all together into a firm, smooth mass; make them into square cakes ½ lb. each; pinch up the edges with the thumb and forefinger, cut out shamrock, thistle, or other ornaments in citron or candied peel; lay on the top (press in a little) a few caraway comfits, or pipe them with the usual compliments of the season in pink and white icing sugar, or write upon them, "We're a' John Tamson's bairns," "Scotland yet," "Ye ken wha frae," "Peace and Plenty," "For Auld Lang Syne," "The Land o' the Leal," etc.

German Shortbread (½d. each).

1½ lbs. flour, 10 ozs. sugar. 10 ozs. butter, 1 oz. ammonia, 5 eggs; mix the butter, sugar, and eggs; then mix in flour, etc., into smooth dough; break into 1 oz. pieces, and roll into fingers; twist into the letter S, flatten them, wash over with yolk, cut down the middle, and bake in good heat.

Neapolitan Sandwiches.

½ lb. ground almonds, ¼ lb. fresh butter, ½ lb. sugar, 10 ozs. flour, 8 yolks of eggs. Cream butter, sugar, and eggs as for cakes. Work in quite smooth the almonds and flour, and put in a cold place to set firm; then roll paste thin on paste-board, and cut out circular pieces size of cheese plate, put upon baking-tin, and bake in a sharp oven until set firm: when cold, jam them as for other sandwiches, place them all on top of each other, and then ornament the top with pink icing, meringue mixture, etc. Colour some chocolate and some red, and alternate layers when putting together after baking.

A Trifle.

Make a "whip" some hours before it is wanted to be used of a quart of cream, 1 glass of sherry, the rind of a lemon, and ¼ lb. fine sugar; whip vigorously, take the froth off as it forms, lay on a sieve to drain. Put in a trifle dish ¼ lb. ratafias, ¼ lb. macaroons, few sponge biscuits, some melted calves'-foot jelly; put this in the refrigerator to set; put ½ oz. isinglass in tablespoonful warm water to dissolve; when melted, mix with 1 pint of thick cream, 3 drops essence of lemon, 2 ozs. sugar and a glass of wine; pour this over as soon as it is mixed or it will set too firm to pour out; when on the jelly, ornament with bright jam, etc., and then pile on it the whipped cream that has been set to drain.

Charlotte Russe.

Line a jelly-mould with Savoy fingers by placing them evenly side by side all round the mould, covering it all up; the place left in the middle cover with a star or piece cut for the purpose. Dissolve ½ oz. of gelatine in as little water as possible, whisk a pint of cream, add to it 2 ozs. of castor sugar and ½ lb. of jam, strained through a fine sieve. Mix the whole together, fill the mould, cover with a piece of sponge cake cut to fit, and set it to freeze. When well frozen, turn out and serve.

Gauffres.

Cream as for cakes, 1 lb. fresh butter, 1 lb. loaf sugar, 1 lb. eggs, gill of brandy, 4 drops essence of vanilla, and a pinch of

powdered nutmeg: stir in 1 lb. fine flour, put on buttered baking-tins, the same as for jumbles, allowing plenty of room to spread; before quite cold, curl or roll them, and sift white sugar over.

Little Mazarins of Lobster.

Set in ice as many copper dariole plain moulds as you may require; open a can of lobster, cut up some of the most ruddy parts, with which cover the bottom of the moulds; pour a layer of bright aspic jelly on this, to set the lobster firmly in; then mask the interior with *whipped* aspic jelly, cut up the remainder of the lobster, or roughly chop it; add mayonnaise sauce and aspic jelly or plain gelatine to it sufficiently to ensure its setting firm; season it to a piquant degree, then fill up the interior of the moulds with the mixture. When one of these mazarins is turned out, by dipping in warm water, as for a mould or jelly, it will form a tasty and attractive little tit-bit, the top showing the red lobster embedded in the crystal aspic, the whipped aspic sides showing a marble whiteness, and the interior, when cut or sponged, shows a creamy, solid mixture of lobster mayonnaise.

Little Mazarins of Salmon.

Proceed as for lobster mazarins, using canistered salmon, and omit the setting of fish with aspic into the bottom of the mould; but mask the whole of the interior with the whipped aspic jelly.

Mayonnaise Eggs.

Boil some eggs hard; shell and put into cold water, cut off a sufficiency of the broad tip, insert a small spoon and remove the hard yolk, pass the yolk through the hair sieve into a small basin, and with a wooden spoon stir oil, vinegar, etc., into it, with sufficient condiments to produce a stiff and very tasty sort of mayonnaise; fill the eggs with this mayonnaise, and stand them on a dish or plate. For hotel, restaurant, or bar.

Chicken Roll.

Make a *salpicon* of mixed chicken and tongue, with a rather stiff white sauce. Have some small long, narrow rolls made; cut them in half lengthways, nearly through; scoop out a certain portion of the interior, but not too much; fill it up with the chicken *salpicon*, close over, and send out in the picnic or luncheon basket. Suitable for picnics, travelling, hunting, etc.; handy for hotel use also.

Butter for Sandwiches.

Beat ½ lb. or 1 lb. of butter to a cream with a wooden spoon in a basin; a *very little* salt and mixed mustard to taste. Use it

as required for buttering the bread for sandwiches. It is a great improvement on the old-fashioned way of preparing sandwiches; is better eating, is far quicker, and more convenient.

Chartreuse of Oranges.

Cut 5 oranges into pieces the shape of the quarters, but only about a quarter inch thick. Dip each piece into clear, stiff orange jelly, and arrange round the bottom of a plain tin, filling up the centre with pistachio nuts, then lining the sides of the mould with the quarters of orange, one row turning to the right, the other to the left alternately, until the mould is full, the pieces of fruit just overlapping each other. Then fill in with about three-quarters pint whipped cream, flavoured with vanilla, brandy, or other flavouring, adding a very little isinglass and sugar (dissolved). When it has quite set, turn out into a glass dish, and, if liked, a little more cream may be poured round, and garnished here and there with pounded pistachio nuts.

Lobster Snack.

Take a good tin of lobster, pick out any stray bones that may be in it, chop it up. Place an equal weight of fresh butter in a basin, beat it with a wooden spoon until it is well creamed; add the lobster, stirring it well in. Stir in flavouring—according to taste and judgment—of anchovy sauce, salt, pepper, and vinegar. To serve, take an ordinary small rasped dinner roll, cut it across into two, place a good teaspoonful of the lobster butter on each piece, spread it smooth, and serve on a small plate. This forms a very appetising luncheon tit-bit. It should be especially useful for luncheon-bars. The lobster butter will keep good for a week or more. Proceed in the same way for salmon.

BISCUITS.

Hard Biscuits.

"HARD" biscuits of all varieties are similar in mixing, kneading, and baking. When the butter and other ingredients are added, they have to be well rubbed in and shaken up by putting the hands underneath the roughly mixed dough, and tossing it up into the air until it is separated into small fragments; this is done to prevent any of the ingredients from remaining undistributed. It is then placed upon a "brake," and cut to pieces by the operator placing his whole weight upon the extreme end of the handle and moving it up and down; when the dough appears "clear" and "smooth," he gradually diminishes his weight upon

the handle, folding it up repeatedly until it is finished. It should then be covered with a damp cloth, to keep it mellow, for an hour or two, and then cut out or moulded into shape, and baked in a hot oven. Care must be taken to keep the air from the dough through the whole operation until it is in the oven, or the beauty and finish will be marred.

If the old-fashioned biscuit-brake is replaced by the greatly improved biscuit-machine, so much the better for the worker and the goods he turns out; if so, then all that will be necessary is to make the dough, let it lie to mellow, properly adjust the rollers, whether for "braking" or rolling out for the cutters.

All plain hard biscuits should be well dried after they are baked, by putting them for some hours in the drying oven, screen, or dry, warm place. If an amateur essays to make biscuits, he will always experience some difficulty in shaping or moulding them; when this is so it will be better to cut them out with a cutter. If penny captains, arrowroots, Abernethys, or biscuits of that class are wanted, proceed thus: Roll the dough out to a quarter inch, cut out with a cutter, and then finish with a rolling-pin, taking care to thoroughly dock them through before baking.

Thin Captains, or Water Biscuits.

4 lbs. fine flour, 2 ozs. butter, 2 eggs, and 1 pint water. Mix and knead as directed, and then roll out very thin, as thin as paper—in fact, the thinner the better; cut out with a cutter, dock them with a docker, very slightly dust a thin tin with cones or ground rice, lay the biscuits upon it, and put them into a very hot oven. If possible, tilt the tin towards the furnace or fiercest part of the oven for a second or two, so that the heat may play directly upon the face of the biscuits, and raise small brown blisters upon them; then put the tin upon the oven bottom to finish. The oven must be red-hot, and the workman smart. Don't let them "perish" in baking.

Thick Captains.

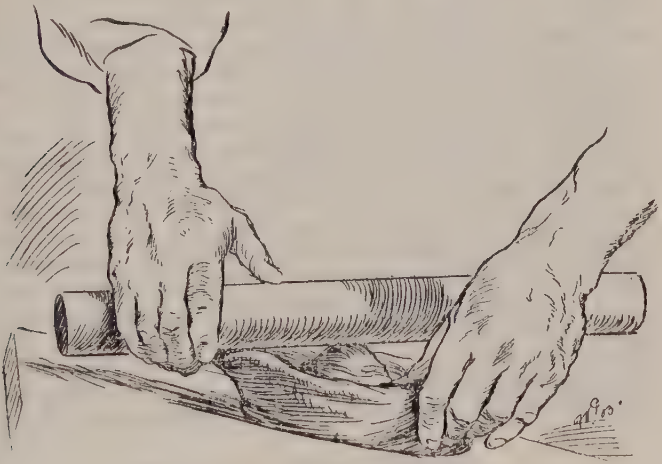
7½ lbs. flour, 1 lb. butter, 2 eggs, and 1 quart water. Mix as directed; when ready, weigh off 2 ozs. each, mould, roll out, dock quite through, and bake in a fairly hot oven.

Abernethys.

7½ lbs. flour, 1 lb. butter, ½ lb. sugar, 2 eggs, 2 ozs. caraway seeds, and 1 quart either milk or water. Mix, roll out, and bake as directed for thick captains, but in a somewhat cooler oven.

Penny Arrowroots.

8½ lbs. flour, ½ lb. butter, ½ lb. sugar, 8 eggs, 2 ozs. arrowroot, ¼ oz. volatile, and 1 quart milk. Rub the butter into the flour, dissolve the sugar, arrowroot, and volatile in the milk, pour it into the flour, and mix as for other hard biscuits; when ready, roll out same as for thick captains, and then cup them upon the bottom of a gallipot by placing them upon it, and working down the sides with the hands until deep enough; take them off, dock them through, bake in a moderate oven. If you wish to cup biscuits the same as the more experienced, mould them into the shape of a sugar-loaf or cone, with a large base tapering to a point; place the rolling-pin upon the top of this point and press downwards (see illustration), rolling backwards and forwards as you proceed, but don't allow the rolling pin to go over the sides; turn the biscuit round, and keep the rolling-pin upon the middle until the sides are high enough.



How to Cup a Biscuit.

Yorks.

3½ lbs. flour, ½ lb. butter, ½ lb. sugar, 2 eggs, 1 pint milk, and piece of volatile as big as a pea. Dissolve the sugar in the milk, and mix as for hard biscuits; when ready, roll out into a sheet a quarter inch thick, cut some into strips one inch wide, stamp them,

and cut off with a knife. Cut another portion into half inch strips, stamp, and cut; make the remainder into various shapes; into fingers by cutting it into long, narrow strips, and into shells by cutting small round pieces; then take the extreme edge between the thumb and first finger of the left hand, and, with a sharp knife or crimping wheel in the right hand, make the ordinary regular circles that are upon cockle-shells, etc. Bake in a moderate oven.

Coffee Biscuits.

1¼ lbs. flour, 2 ozs. butter, 2 ozs. sugar, 3 eggs, and a gill of milk. Rub the butter and flour together. Make a "bay"; put in eggs, milk, and sugar; mix all together, and thoroughly knead upon a biscuit-brake or machine. Failing either of these, beat it upon the table with a rolling-pin, fold it up and beat it out several times, until the "face," or outer surface of the dough, is quite smooth. Put it away, covered with a cloth, for an hour, to allow the various ingredients to become thoroughly amalgamated. When the dough is nice and mellow, roll it out into a sheet, or if it is too large to roll conveniently, cut it into two or more parts; roll these out very thin, and then cut them out with the coffee biscuit-cutter, dock, put them upon tins that have been dusted very lightly with ground rice (but not buttered); bake them in a hot oven which will draw or curl them up, cover the top with small brown blisters, and give them a good appearance. If the stock of biscuit tools does not include a coffee biscuit-cutter, when the sheet is rolled thin enough cut it with a sharp knife into strips an inch wide, and about three inches long, and with a fork prick each biscuit about six times quite through, and bake as directed.

Victoria or Swiss Biscuits.

3 lbs. flour, 2 ozs. sugar, 2 ozs. butter, 10 eggs, 2 tablespoonfuls of milk; prepare the same as for coffee biscuits, but softer; roll very thin, cut out with a round cutter, dock or prick them, and bake in a hot oven. These biscuits are delicious with coffee, and are suitable for invalids, being very digestible and nutritious.

Bath Oliver Biscuits.

1 quart milk, 1 lb. butter, 2 ozs. yeast, 2 ozs. "Textis," 6 lbs. fine flour. Make the milk warm; mix together, and allow to ferment for six hours or more, and then roll it *very thin* in a biscuit-machine or with a rolling-pin. Cut the biscuits out with a cutter as large as a teacup, dock them well through with a pricker, place them upon flat baking-tins previously sprinkled with water, and wash

them over with milk, with an egg-yolk or two mixed in it. When the tins are filled, put them in a cupboard or drawer for half an hour, and then bake in a cool oven. It is of importance to observe that these biscuits must be cut out very thin; the holes made in them by the pricker must be open and quite through the biscuit, to allow the gas and steam to escape, or they will bulge in the middle and be disfigured. They must be well brushed, when being washed over with milk, to give them a smooth, bright surface.

Nursery Biscuits.

1 pint milk, 1 pint water, 2 ozs. yeast, 3 eggs, ½ lb. sugar, 1 oz. "Textis," 6 lbs. flour. Heat the milk and water to 90° F.; add yeast, sugar, eggs, and about ½ lb. flour, mix together, and put away to ferment for two hours. By that time the yeast in the ferment will cease to work, and will, so to speak, be ready for more work; therefore rub butter into the remainder of the flour, add it to the ferment, make into a light, spongy dough, and put it away to allow the yeast to grow and give off carbonic acid gas, which being confined in the dough by the glutinous nature of the mass, will make the dough very light. When it has reached that stage, break it into four or six pieces, mould them, and with a rolling-pin roll into a sheet about half an inch thick; cut out with a plain cutter an inch and a half in diameter, place upon baking-tins a quarter of an inch apart, and put into a proving cupboard, or some warm, moist place out of the draught, to prove and rise. When well risen, bake the biscuits in a good sound oven, after which put them in a screen, drying oven, or some warm, dry place for several hours, to evaporate the moisture, and make them light and digestible.

Thin Arrowroots.

14 lbs. soft white flour, 2½ lbs. sugar, 2 lbs. fat, ½ lb. arrowroot dissolved, 1 oz. soda, 1 oz. cream of tartar, 2 quarts milk, ½ pint eggs. Mix and break as usual for hard biscuits; roll thin, and bake in sharp oven.

Ginger Stomachic Biscuits.

1 lb. castor sugar, 6 ozs. butter, 1½ lbs. flour, 2 ozs. ground ginger, ¼ oz. sal volatile powdered fine, 2 eggs, gill of milk. Rub the butter with flour, make a "bay," add eggs, milk, ginger, volatile, and sugar, draw in the flour, make into a smooth dough, roll with a rolling-pin, cut out into biscuits about a quarter inch thick, put upon a tin, and bake in a sound oven.

Cracknells.

4½ lbs. flour, ½ lb. sugar, ¼ lb. butter, 12 eggs, ½ pint milk, piece of volatile size of pea; rub the butter in the flour, make a "bay," mix the eggs, milk, sugar, and volatile in a basin; give them two or three minutes' whisk, pour into the "bay," shake up as usual for hard biscuits; the dough should be smooth and spongy; place this upon the brake, or under the rollers, and well clear it; roll out to about fifth of an inch thick, dock well, and cut out with cutters, oval, leaf, diamond, or round; lay them out flat as you cut them for a minute or two, and then take each biscuit in the hand, and make them into cup shape by holding them in the left hand, and pressing the right thumb into them. As you cup them, drop them into boiling water—it is usual to have a small copper attached to the bakery where these are made, but a saucepan will answer the purpose; either way, see that the water is kept boiling; as the biscuits rise to the top they will be ready to take out; give them just one minute, and then with a wire skimmer take them out and drop into a pail of cold water; let them remain covered in this water for three or four hours, drain from the water and put on clean greased tins; bake in a hot oven. See that they are well done, but do not perish or burn them.

Granulated Wheat-meal Digestive Biscuits.

2 lbs. of granulated wheat-meal, 1 egg, ¼ lb. butter, 2 ozs. of sugar, enough carbonate of soda and cream of tartar each to cover a sixpenny piece, and ¾ pint of milk. Rub the butter, flour, soda, and acid well together, make a "bay," pour in milk, sugar, and eggs; mix well, make a firm, smooth dough, break into two or more pieces for convenient rolling, roll out as thin as possible, cut out, put upon tins, and bake crisp in a sound oven. The dough when mixed should be kept in a cool place for an hour or two to mellow; it will then roll out freely. Flat tins should be used, so as to ensure baking evenly.

Ginger Cake.

Rub 12 ozs. lard with 4½ lbs. flour, 12 ozs. sugar, 1½ ozs. ginger, 1 oz. mixed spice, and 2 ozs. bicarbonate of soda; make a "bay," and put into it 2 lbs. golden syrup, 4 eggs, and 3 tablespoonfuls of milk. Stir these up, then add 12 ozs. sultanas, 12 ozs. of peel (cut large), and 8 ozs. currants. Mix the whole together into an ordinary soft cake batter; weigh off in 1 or 2 lb. sizes into well-greased square tins, and bake in a cool oven. It is an improvement to the appearance to lay three slices of almond on the top when in the tins.

Oat Cake.

Take the required quantity of coarse Scotch oatmeal, rub into it a small piece of butter, and a little salt, make it into a paste with hot water, leave it to absorb the moisture for five minutes, sprinkle the board with oatmeal, roll into a round shape—the size and thickness of a plate—cut into four quarters, bake on tins in sound ovens.

Oatmeal will swell very much in water, and if too tight will not bind together, but will crack and break when rolling out, therefore be sure and only make a paste of it at first, and then dry it up with oatmeal as you roll it out.

> *Note.*—All meal goods, oat-cake, etc., require great care in baking—the surface, being rough and dry, does not attract the heat; therefore, unless the oven is hot, the biscuit "perishes," and becomes flavourless and unpalatable.

Spice Nuts.

1½ lbs. flour, enough syrup to make a light dough, ½ lb. lard, ¾ lb. moist sugar, ½ oz. ginger, ¼ oz. mixed spice. Rub the lard, sugar, ginger, spice, into the flour; when thoroughly mixed, make a bay in the middle, and pour the syrup in and mix. When mixed, with a rolling-pin roll it out into a sheet, dust it lightly with ground rice to prevent sticking; cut out to the size and thickness of a penny, place them upon well-greased tins, half an inch apart, wash them over with water, and bake in a cool oven.

Snaps.

7 lbs. flour, 2 ozs. powder (1), 4½ lbs sugar, 1¾ lbs. butter, 6 eggs, 1 oz. ginger, 1 oz. mixed spice, 3½ lbs. golden syrup. Rub all the mixture together, except syrup and eggs, make a bay, whip the eggs one minute, then add with the syrup, make a soft dough, and work off as for jumbles.

German Gingerbread.

Melt 1 lb. of honey in a saucepan. When it is quite hot mix into it 6 ozs. moist sugar, 1 oz. of powdered cinnamon, 2 ozs. fine cut candied lemon peel, 4 ozs. almonds blanched and chopped, and enough flour to make it into a smooth stiff paste; make this into cakes of any shape or design, but not thicker than about half an inch. Bake in a cool oven.

Jumbles.

About 14 lbs. syrup, 14 lbs. flour, 14 lbs. coarse moist sugar, ¾ lb. lard, 1 oz. of spice and also ginger. Rub the lard, flour,

sugar, and spice together, add syrup, and mix lightly; roll out very thin, cut with a cutter the size of a teacup, place them upon a baking-sheet (well greased and sprinkled with water) two inches apart, wash them over with water, and bake in a cool oven. Jumbles or snaps should be very thin, and nearly transparent. This dough does not hurt for standing, and a few tins can be baked off as needed.

Gingerbread.

¼ lb. fat, 2 eggs, ¼ lb. chopped peel, ¼ lb. moist sugar, ½ oz. powder, syrup or treacle to make firm dough, 2 lbs. flour, 1 oz. ginger. Put the butter, ginger, sugar, and the flour together, make a bay or hole in the middle, pour in the syrup, add the peel and almonds, and a little spice; knead the whole into a firm dough, weigh into 1 or 2 lb. pieces, make them into squares, press them or mould upon the usual gingerbread block, or put the squares upon the tin and dock them; place pieces of buttered wood against each side, firmly fastened to keep in position, bake in a cool oven, and when baked, wash over with white of egg, which will give a bright gloss.

Common "Seedy's."

3½ lbs. flour, 6 ozs. sugar, ½ lb. butter, 1 oz. of caraway seeds, 1 oz. powdered volatile, about a third of a pint of milk. Rub the butter with the flour, put the caraways and sugar in the middle of a "bay" made in the flour, dissolve the volatile in the milk, and mix the whole into a smooth dough; don't work it about and make it tough; cut out a quarter inch thick with round cutters, place on greased baking-tins, and bake in a very hot oven.

Note.—The oven must be hot to drive off the ammonia.

Cocoanut Drops.

1 lb. fine cocoanut, 1½ lbs. castor sugar, and 10 whites of eggs; whip the whites as for *meringues* into a firm snow, then stir in the cocoanut and the sugar together; when mixed, drop them from the savoy bag as for macaroons upon wafer paper, and bake in a cool oven.

Dessert Biscuits

½ lb. butter, ¼ lb. sugar, 1 lb. flour, 8 yolks of eggs; cream the butter, sugar, and yolks as for cakes; flavour with essence of vanilla or ratafia; then mix in the flour, and drop them in buttons from the savoy bag half an inch apart upon a buttered tin, and bake in a sound oven.

Lemon Biscuits.

Rub the rind of a lemon upon $\frac{1}{4}$ lb. loaf sugar, then crush it to powder; rub 3 ozs. fresh butter into $\frac{1}{2}$ lb. flour; make into a "bay." Put in the sugar and 3 well-beaten eggs; mix this into a smooth paste, roll out thin with the rolling-pin, cut out with a plain cutter, and bake in a moderate oven upon slightly buttered tins.

Queen's Drops.

$\frac{1}{2}$ lb. butter, $\frac{1}{2}$ lb. sugar, $\frac{1}{2}$ lb. eggs, $\frac{1}{2}$ lb. flour. 2 ozs. currants, piece of volatile as big as a pea; cream the butter, sugar, and eggs as for cakes; powder and beat the volatile up with it; mix in flour and currants, but do not work it about much to make it tough; when mixed, put the mixture into the savoy bag, and drop in buttons about the size of a halfpenny upon paper laid on baking-tins, and bake in a hot oven.

Rice Biscuits.

$\frac{3}{4}$ lb. flour, $\frac{1}{4}$ lb. ground rice, $\frac{1}{4}$ lb. butter, 6 ozs. sugar, 2 eggs, a piece of volatile the size of a pea, dissolved in enough milk to make the whole into a nice smooth dough or paste. Rub the butter, rice, and flour together, make a "bay," put in sugar, milk, and egg; mix these latter ingredients a little, and then mix the whole together; roll out with a rolling-pin, cut out with a plain cutter, the size and thickness of a penny, place upon tins, and bake in a hot oven.

Pavilion Biscuits.

$2\frac{1}{4}$ lbs. flour, $1\frac{1}{4}$ lbs. sugar, $\frac{3}{4}$ lb. butter, 3 eggs, a little milk, with a small piece of volatile in it. Mix as for rice biscuits, roll and cut out with a fluted cutter; wash them over thickly with yolk of egg, turn them upside down upon a mixture of blanched almonds and loaf sugar chopped small, slightly press them, turn them over, place upon tins, and bake in a hot oven.

Derby Biscuits.

2 lbs. flour, 1 lb. butter, $1\frac{1}{2}$ lbs. sugar, 3 eggs, 6 drops essence of lemon, $\frac{1}{4}$ lb. currants, and enough milk to make it into a smooth dough. Mix same as for rice biscuits; roll and cut out with a fluted cutter, and bake in a hot oven. This dough will form a good basis for several sorts and shapes, etc. When mixed, divide it into three or more parts, flavour with cinnamon, lemon, vanilla, and some with currants; cut each sort out with different shaped cutters, ornament some with neatly cut pieces of angelica, and some with "hundreds and thousands," those minute sweets of our childhood's days. Do not make the dough too soft.

Lemon Drops.

1¼ lbs. flour, ½ lb. butter, 1 lb. 2 ozs. sugar, 2 eggs, 6 drops essence of lemon, piece of volatile as big as a bean dissolved in about 4 tablespoonfuls of milk, or enough to make a smooth dough. Mix as for rice biscuits, etc. When mixed, take a piece of the dough, lay it upon the board, fold it over, and roll it with the hand backwards and forwards upon the board until about the thickness of a man's thumb, then cut it into pieces about half an inch, place them upon tins upon the cut part, wash over with milk, and bake in a cool oven.

Shrewsbury Biscuits.

2 lbs. flour, 1¼ lbs. butter, 1¼ lbs. castor sugar, 4 eggs, pinch of powdered cinnamon, gill of milk, rub the butter and flour together; add sugar, eggs, cinnamon, and milk; make into a smooth dough, roll thin, cut out with a fluted cutter, bake on tins in a sharp oven.

Small Napoleons.

1 lb. butter, 1 lb. sugar, 1 lb. eggs, 2½ lbs. flour, ½ lb. currants, ½ pint milk, 2 ozs. chopped almonds, 1 oz. baking powder. Cream up as for cake; put a spoonful into long oval tins (small), chopped almonds on top; bake in quick oven. Toughen well when mixing in the flour.

Rich Cocoanut Biscuits.

1 lb. desiccated cocoanut, 1 lb. sugar, 2 ozs. flour. Make into soft paste with white of egg; don't work much; run from savoy bag upon wafer paper; mix with wooden spoon; bake in a cool oven.

DESSERT CREAMS.

NOTE.—Double cream—*i.e.*, very thick cream—should always be used for whipped creams; but do not whip them too much, or they will be liable to curdle or become butter. It will be firm enough as soon as it stands in the position or shape you place it in. If for a large cream, more isinglass or gelatine in proportion must be used; small ones, of course, have much less weight to carry. In adding wines or acids, reserve them till just before filling; they are liable to curdle the cream.

Strawberry Cream.

Pick the stalks from 1 lb. strawberries, mash them with ¼ lb. fine sugar, rub them through a hair sieve with a wooden spoon,

dissolve 2 ozs. gelatine in ¼ pint warm milk; let this cool a little; whip 1 pint of thick cream, and stir it with the pulp and the gelatine solution; if not dark enough, add few drops of cochineal, but do not waste much time over this part, the acid from the fruit is liable to turn the cream, and the gelatine is set before you have moulded the cream; as soon as mixed, put into mould or moulds, put on ice to get firm for an hour or so. Raspberry and red currant prepare in the same way. If fruit is not obtainable, use 1 lb. of jam, little or no sugar.

Italian Cream.

Dissolve 1 oz. isinglass in a tablespoonful of hot milk, make a custard with ½ pint milk, 3 yolks of eggs, 2 ozs. of sugar; stir in 4 drops essence of vanilla, ½ glass of brandy; allow to cool a little; stir in isinglass and a well-whisked ½ pint thick cream; put in oiled mould, and set on ice.

French Cream.

Dissolve 1 oz. gelatine or isinglass in a tablespoonful of hot milk, add ¼ lb. sugar, ¼ lb. apricot pulp, teaspoonful of lemon juice, and lastly 1½ pints cream. Mix carefully; mould; put away to set as before. When different colours are required in moulding, put them in, and let each set firm separately before adding the next.

Blancmange.

Dissolve in 1 quart of warm milk 2 ozs. gelatine or isinglass, flavour with the rind of lemon and cinnamon stick, boil up for a few minutes, strain or take out the peel and cinnamon, stir in a little brandy, a half pint of cream, and pour into moulds and allow to set in a cool place. Other flavourings—rose, vanilla, orange, etc.—may be substituted for the lemon and cinnamon. 1 or 2 ozs. of cornflour may be boiled with milk if preferred, firm and thick.

Lemon Cream.

Soak 1 oz. of gelatine in a little milk as before directed; then put into a stewpan with ½ pint more milk and the rind of five lemons; boil for about five minutes, then strain, add 1 pint cream and ½ lb. of powdered sugar, the juice of 2 lemons, and the yolk of an egg well beaten, and a little egg yellow, to give it a lemon colour. Whisk all well till spongy, then put into the mould. Let flavours be delicate, but pronounced, not insipid.

ICES.

The demand for ices is increasing every year; from being a luxury, seen only upon the tables of the rich, they have now become a necessity among all classes of society; and bakers, etc., who wish to occupy their time profitably will do well to consider the ways and means of making ice-creams. The process is not elaborate, nor are the utensils expensive, and with the recipes here given the most inexperienced should be able to make them fairly successful. The utensils should consist of one or more freezers, a tub or tubs to contain them, and a spatula to work the ice from the sides into a smooth mass; these can be purchased now in the form of a machine which contains them all, and is simple and cheap. If you purpose essaying to try your hand, send for price lists to firms supplying such goods. A few general notes or hints will be useful to consider before quantities are given. First, if you can purchase and use a saccharometer do so. When making up ices from the juices or pulp of fruits, it is extremely difficult to secure perfect uniformity, and maintain an unvarying standard without it. When using the saccharometer, from 19 to 21 degrees of strength of the fruit syrup will be found the best, and used in conjunction with clarified sugar (see "Clarified Sugar"), there should not be much fluctuation; without it the palate must be your guide. Make them nice; but if too rich in sugar and fruit they will not freeze well; if too poor, they will resemble frozen snow, and be tasteless. It will be necessary in nearly every case to use essences to perfect the colour or flavour; use sparingly, coarse flavourings offend refined palates and vulgar colours the eye. Be careful that the salt you use in freezing does not by any chance touch the cream: it will spoil it entirely. When turning the freezer, if the rough ice around it is melting and sloppy, draw off the water and re-pack. When you turn out ice puddings, etc., from moulds, carefully wipe all the salt and moisture from the outside before taking off the covers. To preserve the rough block ice not in use, bury in sawdust and cover with paper and flannel. To cut up for use, use an ice-piercer (a long stout needle fixed in a handle); dig this once or twice in the part you want to break, and the piece will break off without waste. To pack the tub for freezing, use three parts of crushed or small pieces of ice, and one part coarse freezing salt—ordinary salt will do, but not so well, if it is inconvenient to obtain others.

Strawberry Water Ice.

To 1 quart of water, add the pulp from ¾ lb. strawberries, or ¾ lb. strawberry jam; the juice of two lemons, and clarified syrup

to taste. If not strong enough of strawberry flavouring, use a drop or two of strawberry essence, also deepen colour with a few drops of cochineal. Strain through a sieve and freeze. Don't forget the note about richness. When ready place in the freezer; put the lid on, pack it well round, and give it a few minutes' brisk turning; take off the lid if it is a hand freezer, and use the spatula to scrape it down from the sides; with the lid off, give it another few minutes' brisk turning, by taking hold of the top with thumb and fingers of one hand and giving it a sharp twist round. As the ice forms inside, work it down with the spatula until the whole is a smooth firm mass; cover up, and it will be ready for use. During the time of portioning it out to buyers, give it an occasional work down with the spatula.

Lemon Water.

Rub the rind of 2 lemons on sugar, dissolve in $\frac{1}{2}$ pint of water; add 1 pint syrup, the juice of 1 orange, the juice of 6 lemons; mix, strain, and freeze as before *directed.* Currants, cherries, gooseberries, and other fruits may be prepared in the same way, by mashing, if soft, in cold water, or pulping them by boiling, straining, and flavouring. If any fruit ice should not be acid enough, use a little lemon juice or a pinch of citric acid. A couple of whisked whites of eggs, or 1 oz. dissolved gelatine whisked, and added to water ices when freezing, will give it more body.

To clarify Sugar for Simple Syrup.

Add to $3\frac{1}{2}$ lbs. sugar 2 pints water, mix together, and boil gently for five or six minutes, skim off the dross or scum as it rises, and when cold keep in a bottle for use as required.

Cream Ices.

Neapolitan ices are made by preparing different kinds of ices and moulding them together. Boil $\frac{1}{4}$ lb. good rice in 1 pint milk until quite soft, add 1 pint cream and stick of vanilla; boil one minute, and let cool; then strain off the thin part, put 8 yolks with it, stir with a wooden spoon over the fire until it thickens (it must not boil), let it cool, and then add 1 pint double whipped cream; mix, and put one-third of this with the rice that was left in the pot; take out the vanilla, and freeze this as usual. When nicely frozen and smooth, put this into Neapolitan moulds—these are very small moulds that open at the side; place these in the ice cave, packed up with ice, until required; then dish them up with the remainder of the cream that was left. Put two or more different colours together after freezing when filling the moulds

(2) Neapolitan.

Yolks of 8 eggs, small glass cold water, gill of maraschino (liqueur). Mix these together, and add syrup sufficient to make it sweet—a nice piquant sweetness that you like to taste twice. Place this in stewpan on the fire, and whisk it until it comes to a thick cream-like appearance—*don't let it boil;* take it off the fire, give it five minutes' brisk whipping with the whisk; when very light, put it into the freezer, cover with a cloth, let it cool, then stand the freezer in ice for three or four hours till wanted. When frozen, some of this can be mixed with other ice; take it carefully out of the middle, and put in the place you have taken it from an ice of different flavour and colour.

(3) Neapolitan.

1 pint cream, 3 eggs, ¼ lb. sugar, 6 drops essence of vanilla. Break the yolks up slightly, put the sugar in, beat them a little till smooth, whisk the whites to a light froth, then add them to the yolks and sugar; now mix this with the cream and flavouring, whisk, place altogether in the pan, and simmer as before. When ready, rub through hair sieve, allow to cool, then freeze it in the usual manner by taking the chilled cream, put in a freezer, cover, put the freezer in the freezing tub, well pack round with 1 part salt, 3 parts ice, occasionally sprinkle a handful of salt on the ice while freezing, give a few turns, and work it down smooth with the spatula; then turn until the cream is frozen even and smooth all through. If the ice is sloppy, draw some water off, re-pack with fresh ice and salt, cover up well; then put a blanket or cloth that has been wetted with the salt ice water you have drawn off all round it, and leave about two hours to perfect. If to be sold in moulds, and of different colours, lay layer upon layer, fill them quite full, pressing the cream into all the corners, fasten the cover on firmly, cover the mould with paper, and bury in the usual mixture of ice and salt. This must stand an hour or two. When required, take the mould out of the ice, wipe or wash off the brine by quickly dipping in cold water, wipe it dry, lift off the cover, take out the pins if it is in parts, and in a minute or two it will be easy to slip it out on its dish.

Ice Pudding.

Make a rich custard with 1 pint milk, yolks of 6 eggs, 3 ozs. sugar, 6 drops vanilla; when the custard is ready, add 1 pint cream and gill of maraschino, freeze in the usual way; have ready the moulds, and some dried fruits, some sponge cake moistened in cream or milk; put a layer of the frozen custard in first, and then alternate layers of slices of sponge cake, custard,

and fruit until *quite* full; put the cover on, embed in ice; and pack, wipe, and turn out as before directed. An assortment of small dried fruits, mixed into the frozen custard, and moulded, make a nice pudding without the sponge cake, being much easier to make.

Coffee Ice Cream.

Flavour a pint of boiling milk with good essence of coffee, or (if preferred) some strong, freshly-made coffee, ½ lb. sugar, 6 yolks of eggs; simmer gently as for custard. When it thickens, add 1 pint of good cream, stir for one minute over the fire, and when cold, freeze in the usual way.

Chocolate Cream.

Dissolve ½ lb. of best chocolate in ½ pint boiling milk, add 1½ pints cream and ½ lb. sugar; boil until the sugar is melted; strain through hair sieve; when cold, freeze in the usual way. If to be moulded, while freezing work until smooth, put it in the mould, keep in ice until wanted; turn out as directed.

> *Note.*—All cooked creams or custards for ices must be quite cold before being frozen; they are apt to curdle, besides losing flavour, if put in warm.

Vanilla Ice Cream (Cheap Shop Sale).

Well whisk 8 eggs, put them with 3 pints milk, 1 pint cream, 8 drops vanilla, 14 ozs. sugar, 2 ozs. of quite fresh butter; mix together in the boiling pan, and bring to boiling point in the usual way; keep the custard well stirred from the bottom, and when it is thick, strain it through sieve into freezer; let it cool; freeze as directed.

> *Note.*—These are a few examples that cover nearly all the whole of the principles that govern ice-making. You will gather from them all that is necessary for ordinary occasions. First, observe that eggs, and creams or milk, have to be made into a custard by cooking; and that the difference between a plain and a rich ice lies chiefly in the ingredients, and not in the preparation; less or more eggs, milk instead of cream, with added corn starch and gelatine to give body, will make all the difference; raspberry and strawberry flavouring substituted for fruit, and a pinch of citric acid in lieu of lemons, cheapen a mixture very much. By having in remembrance the note at the beginning of this article about the working of poor and rich mixtures, you will be fairly safe. There is a very good thing in this line that is quite new that I must find space for. When travelling through the United

States of America I came across, especially in the cities of New York and Columbus, a kind of frozen meringue mixture, the recipe for which is very simple: Whip some cream stiffly, flavour, colour, and sweeten with any sort of essence, cordial, or liquor. This is put into very small fancy tankards (heaped up), and then put into the refrigerator (or freezing cupboard) to freeze without any further working. In some cases this was blended with one-third of whites of eggs whisked to a snow.

BOILED SUGAR GOODS.

The "Bakers' Guide" finds its way into many places where it may not be convenient to purchase such articles. To meet such cases the annexed recipes are given. The instructions are of the briefest kind, and will serve only for a foundation practice. The most minute description of the various degrees given by sugar boilers as separating or defining the different stages through which boiled sugar passes would avail little. You must, by patient observation and experience (with sugar as with flour, etc.), work out from within yourself the required knowledge, by touch, sight, smell, taste, instinct, aided by thermometer.

The Degrees in Sugar Boiling.

Having made up a good fire, with either coke or charcoal, and allowed it to burn fairly clear, put into the preserving-pan as much refined sugar as you need for the work in hand, allow not quite half a pint of water for every pound of sugar, and a pinch of cream of tartar; place this on the fire, stir all together. If the fire is very hot, pull it a little to one side, do not let it boil until the sugar is dissolved, then let it boil rapidly; carefully skim all the dross or scum off that rises to the top; let it continue to boil, dip your finger in cold water, and quickly nip a little sugar out; press finger and thumb together, and open them again quickly—if the sugar forms thin threads, that is the first degree, called candy; boil this candied sugar (this is suitable for candies) a minute or two longer, until the sugar taken in the skimmer, and blown, forms into bubbles or bladders—that is called the blown degree; boil this (blown sugar) another minute, try again—if, when you jerk the skimmer from you, the sugar flies off in flakes, it has then attained what is called the third degree or feather; boil the sugar still another minute, just time enough for you to draw some cold water; put a stick in the sugar, and then put it quickly into the cold water—if it becomes quite hard directly, it is then the fourth degree or crack (this is suitable for making barley sugar and drops); but when for barley sugar throw in pinch of citric acid or juice of

a lemon; and be sure the water is perfectly cold when you put the sugared stick into it. To arrive at the last stage, called the caramel degree, boil the sugar a little longer; put a little into cold water, and if it cracks like glass, it is then the required degree. These are the rule-of-thumb tests. If you get a thermometer and ascertain the degree to boil to for the goods you are making, there is no reason why you should not make better goods in a year with it than in five without it. The candy degree is 230° F. to 250° F.; fondant, 240° F.; crack for drops, 320° F.; caramel, 350° F.

Drops.

Acidulated drops, tablets, coloured or white drops, with nearly any flavouring, may be made from the following: 5 lbs. sugar, ¼ oz. cream of tartar, ½ oz. tartaric acid, pint of water, and what flavouring essence and colour you may require; boil up sugar and water as directed, dissolve the cream of tartar in a tablespoonful of water, throw into pan, and boil to "crack" 320° F.; pour upon a well-oiled slab, let it cool sufficiently to work in the colouring, flavouring whatever you have ready, and the tartaric acid (do not overdo the colour and flavour); and when getting firm enough, put in pieces through the drop-machine (these are not dear); dust with fine white sugar, and pack in air-tight tins.

Boston Butter Scotch.

3 lbs. sugar, pint of water, ¼ oz. cream of tartar; boil as the preceding, to crack; add ½ lb. good sweet butter and a teaspoonful essence of raspberry; as soon as mixed in pour into moulds; when cold, wrap up in the usual way in waxed paper, tinfoil, etc.

Barley Sugar.

Boil and clarify, as directed, as much sugar as you require, say 4 lbs., a pint of water, ½ oz. cream of tartar, teaspoonful essence of lemon. When commencing to boil, mix the cream of tartar in a tablespoonful of water, and put in pan; boil up to crack, mix in flavouring, turn out on a well-oiled slab; let it cool sufficiently to take in hands; cut in strips (use the scissors) six inches long, half inch wide; take each end between thumb and finger, and twist in opposite directions; stand upright in air-tight tins. A nice *palace sweet* is made by dipping cut slices of candied peel in this boiling.

Horehound Candy.

Make 1 pint of strong decoction of horehound by pouring scalding water on; and then, boiling up two minutes, strain, and put this with 2 lbs. sugar into the pan; boil as before directed for candy (250° F.).

Black Currant Lozenges.

Mix ½ lb. sugar with ⅓ pint of juice; dissolve 1 oz. gelatine. Just simmer the whole in a pan for twenty minutes; pour in thin layers in tins about a quarter-inch thick. When nearly cold, stamp out small oval or round shapes; slightly dust with fine sugar, and pack in boxes.

Cough Lozenges.

Dissolve 1 lb. liquorice in a pint of water, ½ teaspoonful tartaric acid, teaspoonful oil of aniseed, teaspoonful powdered ipecacuanha. Make the liquorice and water into a thick gum with powdered gum-arabic, and then mix the whole into a stiff paste with fine sugar; work this up, cut out, dry, and pack.

Good Cough Drops.

Make a strong decoction of horehound, about 2 ozs. herb to ½ pint of water. When boiled five or ten minutes, strain; make into 1 pint with water; add 7 lbs. sugar, ½ oz. cream of tartar, as for other boilings; keep stirring while boiling up to crack (320°); let it cool quickly; work into it on the oiled slab tablespoonful oil of aniseed, 12 drops oil of peppermint, 1½ ozs. tartaric acid; cut out as for drop goods.

Prize Butterscotch.

1 lb. fresh butter, 1 lb. sugar, ½ pint cream. Boil 250 to 260° F. Be careful; it will burn quickly.

BUNS, SCONES, etc.

Helensburgh Scones.

Fine white flour, 4 lbs. (bare), 1 lb. good butter, ¾ lb. sugar, pinch salt, 1 quart sour milk, ¼ lb. powder. Rub all together thoroughly, make a "bay," pour the milk in, rub it up well and quickly; weigh into pieces of 14 ozs. each, roll them out about six inches in diameter, dock, break each piece into four, roll them round, slightly flatten, and bake on an iron bottom; when partially baked, turn them over, and finish in a sharp oven.

Scotch Soda Scones

2 lbs. flour, ½ lb. butter or lard, a teaspoonful of salt, 1½ ozs. powder, 1 pint of milk or buttermilk. Rub the butter and flour together, make a "bay," pour in milk, add salt, mix lightly and buickly; divide into four pieces, mould into round balls, and roll with rolling-pin to the size of a small plate; dock them with

a "docker," cut into quarters, place together again, wash over with yolk, and bake in hot oven.

Brown and whole-meal scones are made in the same way, and are usually very much liked.

All plain soda goods should be baked in a good hot oven.

Cream Scones.

2 lbs. fine flour, ¼ lb. sugar, pint milk (if sour or curdled, it will rather improve the lightness), ¼ lb. salt butter, and 2 ozs. of powder. Mix the butter, flour, and the powder together, and rub fine; make a "bay," put the milk in, and mix quickly and lightly into a dough; break this in eight parts, mould them, and roll out about the size of smallest plate; wash over with yolk of egg, place upon a buttered tin, and put them into a hot oven. When they are just beginning to brown, take them out, and with a thin flat knife turn them over quickly, and then back into the oven until baked. Do not allow them to be done before turning them, as that will spoil the "finish," but about half-done, and then turn them over to finish baking.

Fermented Scones.

1 pint milk, 1 pint water, made warm; add 1 oz. yeast, 3 ozs. sugar, and 2 handfuls of flour; put away to ferment. When ready, rub ¾ lb. butter, 1 oz. powder, teaspoonful of salt, into enough fine flour to make a free soft dough (it will take 4 lbs. altogether), weigh into 14 oz. pieces, roll out and cut in quarters as before, place upon baking-tins, and put in the proving cupboard to prove until quite light, then bake in a good sound oven. All scones should be washed over with egg and milk before baked.

Rusks.

3 eggs, 1 pint milk, 1 pint water, 1 lb. sugar, ¾ lb. butter, 3 ozs. dried yeast, and about 4½ to 5 lbs. flour; ferment the same as for buns. When the dough is ready, weigh into pieces of 1 lb. each, fold them into squares, and let them prove five minutes; then carefully fold and roll them into long rolls of about twelve inches, put them upon tins to prove, and when well risen bake thoroughly, but not too brown; and on the morrow cut them into thin slices with a sharp knife, lay upon tins, and put them into a hot oven; when browned or toasted, turn them over. For Dutch rusks roll 1 oz. pieces round like buns; prove and bake; when cold, cut in half through top and bottom, and toast in good heat.

Bath Buns.

Set a ferment with ½ pint milk, ½ pint water (at 90°), 2 ozs. sugar, 2 ozs. yeast, 2 ozs. flour; when subsiding, rub 3 ozs.

butter into 2 lbs. flour, essence of lemon, and make dough; put this to prove in a warm place for an hour; then chop into it roughly, and not too much, 3 egg yolks, ½ lb. rough pieces of sugar, 2 ozs. fine peel, 2 ozs. sultanas, and at once put them on baking sheets with a fork in rough pieces of 2 ozs. each; prove slightly, lay 3 comfits on top, dredge with sugar, and bake. There is upon the market a pearl sugar very suitable for bath buns and rice buns.

Fermented Buns.

As an economical luxury, the penny bun is without a compeer in the whole realm of pennyworths, nor is there one that will return more profit to the maker or satisfaction to the eater. Unfortunately, of late its time-honoured reputation in this respect has been severely tarnished by its niggardly makers, who seem to be more concerned about the polish on the outside of the bun than the necessity for butter and eggs inside of it.

If bakers will take the trouble to compare the cost of the raw materials, and the cost of the labour in making the best bun they can make, with that of pastries and confectionery, they will find that the profit side is taken by the bun.

Another inconsistency—almost it might be called a freak—on the part of bakers in the way they have dealt with making buns is the difference they make in the quality of the Good Friday bun and the bun of every day; the latter they starve, and the former they gorge with richness. The contrary of this should be the practice, for the ordinary bun is not only minus the troublesome time-wasting cross, but it forms a part of the daily work of every day in the year; but the Good Friday bun comes in on one day only, and upsets and nearly strangles all labour and other business arrangements. So much so has this been the case, that many bakers have publicly stated that Good Friday buns are not worth the trouble of making. On the other hand, there are bakers who say that the ordinary buns are not worth making, because there are so few sold.

Bakers who say this, in both cases, are lacking in the true commercial instinct. By this "let go" policy they have already lost most of their manufactures and sales, and have now only left to them the loaf and the bun, and therefore they should cling to the bun, both minus and plus the cross. The fact is that they make too much of the one-day article and too little of the everyday article, and that they gorge the former and starve the latter, the one so rich as to be heavy, the other so poor as to be as "dry as dust."

Another point in favour of the bun is that it has been the base

and foundation of all the true and useful fermented classes of confectionery now upon the market.

The following recipe will make a profitable and eatable bun, and make about fifty penny buns :

To each quart of liquid (half milk and half water) at 100° F. add ¼ lb. of sugar, ¼ lb. flour, 3 ozs. yeast, and 3 eggs. Mix these together and leave to ferment for three to four hours, and have ready and add to it 3½ lbs. flour and ¾ lb. butter (flour and butter rubbed finely together), 1 lb. fruit (mixed sultanas, lemon and orange peel, currants, and dried cherries), ¾ lb. sugar, and 5 drops essence of spice; make the whole into a soft dough, and leave it to aerate three hours; then knead it together, and weigh off into pieces to make the size required. Mould each bun up with a tight stretched skin surrounding it, and place it upon a greased baking sheet. When upon the baking sheet, put into a warm moist place (proving cupboard) to aerate until well risen, and then bake in an oven (heated to a high temperature). When baked, wash over with a wash made with milk and eggs (with a little added sugar to sweeten). Use a soft brush for this final glazing, and also a gentle hand, or they will be knocked down, and therefore heavy.

If the buns are to be crossed, cross them with the stamp (for that purpose) when they are about half risen on the tins, and then put them back into the warm cupboard to finish rising, and then bake and wash over as before.

> *Note.*—When making buns, use a strong (in gluten) best white flour, so that it will bear the strain and retain the gas generated by the yeast, and be sure that the dough is ripe, *i.e.*, lively and full of gas before using.

PETIT CHOUX PASTE, ÉCLAIRS, AND CREAM BUNS.

THESE are made from a batter which, as in the case of Derby wine biscuit, dough, and Genoese pastry, may become the basis from which are worked out several very ornamental dishes of light, digestive, and highly delicious buns or cakes. They are very nice with any kind of preserve; whipped, sweetened, and flavoured cream; chocolate, custard, sultanas or raisins, and can be flavoured with either essence of lemon, orange, vanilla, or powdered cinnamon. Prepare as follows: 1 pint water, 2 ozs. sugar, 4 ozs. butter, ¾ lb. flour, 9 eggs. Put the water into a stewpan large enough to allow for stirring, and let it boil up. Stir in the

butter; when boiling, add the flour and boil again, keeping it slowly stirred all the time after the flour is in. Stand the stewpan on one side for four or five minutes, then well beat in the eggs one at a time, and it will be ready for baking. Run out of the savoy bag in fingers and round pieces size of half-a-crown upon a baking-sheet, and bake in a good "sound oven." For fancy varieties, when done take some out and sprinkle with powdered loaf sugar, then sprinkle with water, and put them quickly back into the oven until the sugar is melted, and becomes set in bright glossy flakes or bubbles; they will then be ready. When cold, make an incision in the side and put in any kind of preserve or cream; wash them over with egg. Sprinkle them over with finely chopped almonds and loaf sugar, as for pavilion biscuits. Moisten this with some of the egg wash by shaking the brush over them, and bake them slowly a bright golden brown. Or bake them quite plain, and when baked, scoop a small circular hole out of the top of each; fill the hole with whipped cream, sweetened and flavoured; pipe round the outer edge with white and pink icing sugar, and place a small bright glazed fruit on the centre of the cream. Or glaze them with melted chocolate, add it to fondant, work together over the fire for a minute; add 6 drops essence of vanilla. Stand it near the fire, or on the hot plate, to keep it warm, and dip the top into this mixture, and put it into the oven for two minutes to make shine.

Cream Buns.—The same mixture, but add a piece of ammonia as big as a pea, and bake them under tins. When baked, cut open at side, put some custard in, and then dust over with fine white sugar.

Chelsea Buns.

Ferment, as for ordinary buns, 1 pint milk, ¼ lb. sugar, 2 ozs. yeast, 6 yolks, handful of flour; when ready, rub ¼ lb. butter in about 1½ lbs. of flour, 6 drops essence of lemon in ferment, and tablespoonful of weak egg (yellow); mix, and make into light dough; give this one hour's proof; roll it out to about half inch, put ¼ lb. sugar in dredger, dredge a little on the dough, spread the dough with 6 ozs. good butter, fold it up as for puff paste, and roll out twice or three times; roll it up after this (the same as for any jam roll) to 1½ inches in diameter; cut this up in pieces of one inch, and stand them close together, cut sides downwards, on buttered tin; prove, wash over, and dredge with sugar; bake in a steady oven.

Cinnamon Biscuits.

Beat 8 eggs with ½ lb. sugar, ¼ oz. of powdered cinnamon; make into a firm paste with about 1 lb. of fine flour; roll out

thin; cut out with fancy shaped cutters, and bake on a buttered baking sheet.

Cocoanut Biscuits.

1 lb. sugar, ½ lb. desiccated cocoanut, the whites of 7 eggs; beat the whites to a firm snow as for meringues, add the sugar and cocoanut, make into small round balls, place them upon wafer paper on a flat tin, sift fine sugar over them, and bake in a cool oven.

Dessert Biscuits.

Cream as for cakes, ½ lb. fresh butter, and ½ lb. sugar, 6 yolks of eggs; flavour with any of the essences as desired; then mix in carefully 1 lb. Hungarian flour—it will be then about the consistency of queen's drops; run them out of the savoy bag upon paper as queen's drops, and bake in a sharp oven; if too stiff to flow from the bag, roll with pin, and cut out with fancy-shape cutters.

Ice Wafers.

Well beat 6 eggs, add 1 lb. sugar, 12 drops essence of vanilla, 3 pints milk, ¾ lb. flour, and bake in usual way; make the wafer irons hot, butter them, put the mixture and close the irons; put on fire; turn, when done, on other side.

Cream Slices.

Base: 2 lbs. flour, ¾ lb. butter, 1 lb. sugar, 6 eggs, ¼ oz. baking powder, 6 drops essence of lemon; rub butter and sugar together, and mix the whole into a short, dry dough; roll one-eighth inch thick, cut into strips of three inches wide, and bake in good heat—not hard. Then prepare a meringue, by whipping to a stiff snow 18 whites of eggs; add, while whipping, a sprinkle at a time, 2 lbs. sugar; when stiff, take the baked strips of sweet paste, spread them with preserve, and then lay on them the meringue, and with a knife scoop it up each side to a point; let it be two inches thick in the middle, starting from nothing at the sides. Sprinkle with cocoanut (cut fine), dust with castor sugar, and put into oven to brown a minute or two; when brown, cut into one-inch slices with a knife dipped in water. Boiled meringue is very suitable for this "cream."

Chocolate Dessert Biscuits.

½ lb. sugar, 6 ozs. ground almonds, 2 ozs. melted chocolate, 2 ozs. flour; mix to a firm dough with whites of eggs, cut out with 1½ inch cutter, dust well with icing sugar, and bake in cool oven.

Crescent Dessert Biscuits.

¾ lb. flour, 6 ozs. sugar, ½ lb. butter, 4 yolks, the grated rind of a lemon, ammonia size of pea; rub sugar, butter, and flour together, add other ingredients, mix into smooth dough, roll one-eighth inch; cut out with 2-inch cutter, then with 1 inch cutter cut out one side, leaving form of crescent. Make a thin paste with icing sugar and whites of eggs, lay it on with brush, and bake in cool oven. Colour some of the icing pink.

Aniseed Biscuits.

1½ lbs. sugar, 1¼ lbs. flour, 12 eggs, 2 ozs. aniseed, ¼ oz. ammonia; whip up as for sponge cake, mix in flour, and drop about size of half-crown on nicely-papered, waxed, floured tins; dust with sugar before baking.

Russian Paste.

2 lbs. flour, 2 lbs. sugar, 2 lbs. eggs. 3 lbs. flour, 1 oz. powder; cream butter and sugar and eggs as for cakes, and add flour and powder, mix in; take off one-third and stir into it 2 ozs. melted chocolate, one-third colour pink, and then put each colour alternate and roughly one upon the other in veins, and bake. When cold, cut in fingers, glaze top with apricot preserve, and the extreme ends of top in fine-cut cocoanut.

Raspberry Buns.

¾ lb. sugar, ½ lb. butter, 4 lbs. flour rubbed fine; add 4 eggs, 1½ ozs. powder, and enough milk to make soft dough; roll round pieces about 2 ozs. each, put a spot of raspberry jam on top, pinch the dough up round it to enclose it, wash over top, dip in castor sugar, and bake in good heat.

Lemon Honey Cheese Curd.

(1) Put into a stewpan, on a slow fire, 1 lb. sweet butter, 2¼ lbs. sugar, 30 eggs, juice of 6 lemons, the zest rubbed off rind of 3, and put over gas or fire until quite thick; do not burn.

(2) 9 yolks, 1 lb. sugar, 6 ozs. butter, juice of 4 lemons, 1 zest; proceed same. It will burn quickly, and must be on a very slow fire. It is better to stand the pan in another containing water, and then put over fire.

Halfpenny Rice Cakes.

1 lb. margarine, 1½ lbs. sugar, 5 lbs. flour, 6 eggs, 1½ pints milk, 5 ozs. powder; rub the butter, sugar, powder, and flour up fine, add eggs and milk, mix quickly; mould in little balls, wash over with milk; dip tops in either cocoanut or granulated pearl sugar, and bake in good heat.

Almond Dessert Biscuits (Parisian Biscuits).

2½ lbs. sugar, 1 lb. ground almonds, 3 ozs. flour, and whites of eggs to make it into a dough stiffer than macaroons—just stiff enough to force through a star tube on to wafer paper, and keep its shape; make a variety of shapes. Melt some chocolate, and mix with a little of the mixture; put this through a smaller tube, on to rings, etc., from larger tube (about ½-inch, squeezed out), and ornament these chocolate dots with pieces of dried cherries, etc. Force three pieces together to resemble a cluster of filberts, and ornament with cut almonds. When the mixture is all run out, put the tins aside for a few hours to dry, and then slowly bake in cool oven.

TO MAKE FONDANT.

For glacé work, etc., 7 lbs. sugar (the best loaf or Dutch crushed), 3 lbs. water, ¼ oz. cream of tartar, or 1 lb. glucose (liquid glucose is more reliable than the dry solid). Glucose is not crystallisable, and therefore its use is twofold—by preventing the too rapid crystallisation of the boiling sugar, and giving more gloss to the glacéd goods. The use of cream of tartar is to prevent the too rapid crystallisation of the boiling sugar; dissolve in a tablespoonful of water, and put it in as soon as the sugar begins to boil. Proceed to make the fondant by putting the water and sugar together into a stewpan or sugar-boiler, place on one side of fire, and stir slowly until the sugar is quite dissolved, but do not let it boil; it must be quite dissolved before commencing to boil; then boil up rapidly on a fierce, clear fire. As soon as it begins to boil, dip your fingers into water, and pass them round the inside of the boiler to wash down the dry crystals that have formed there by the water from the boiling sugar being evaporated by the hot sides; if they were to remain there, the fondant would be "grained," or crystallised, and therefore no good. When it has been boiling three or four minutes, and begins to throw up little pearling beads, dip a finger into cold water, and rapidly dip the finger into the boiling sugar and take up a little, gather it between thumb and finger, and if it forms a soft ball it is ready. Try with a thermometer, and when it registers over 235° F. it is ready; it must not exceed 240° F. When boiling, before it is ready, and after the sides are washed down with water, put the lid on for a minute, so that the rising steam will be kept in, and condense on lid and sides, and run down into the sugar; and by so doing ensure washing off the sides the forming crystals, which are so dangerous, by preventing smooth fondant. When

boiled enough, have ready a slab, with pieces of square inch iron bars laid round to prevent the sugar running off; then sprinkle the slab with water, and pour the boiling sugar on to it; allow to cool for five minutes, and then with a good-sized wooden spatula work about it rapidly, gathering it up from the sides into the middle repeatedly; work hard upon it until it turns into a white smooth mass like butter or whipped cream.

> *Note.*—The lower the degree, 230° (to obtain smooth fondant), the more work must be put into it; but the better fondant will result in its being softer and more glossy, and finer in grain. The more it is boiled, and the hotter it is worked up after poured on to slab, the quicker it will cream up, but the coarser will be the grain, and harder. Where it quickly forms a crust while cooling upon the slab, let cool to 100°; sprinkle over with water before beginning to work up.

When using fondant for glacé, put the quantity required into stewpan, and slowly warm it to about 90° or 100° (it must never boil or get very hot after it is made, or it will be altered, and lose its polish, and be no good for this work), then dip the article into it, or pour it over if it is large, and put the goods quickly into a drying oven, or mouth of oven, for a minute to make the gloss perfect. If the fondant is too stiff when melted, reduce it with a little syrup (clarified sugar), which you should always have ready.

For chocolate glacé, melt about one part unsweetened best confectioners' chocolate to two parts fondant, and when both are melted, mix together. If good chocolate is used, it will melt like butter. Add any other colouring and flavouring matter you need when the fondant is melting.

Fondant is also cheaper, and, of course, better to use in place of water icing, because the water has been boiled into it and crystals dissolved, and the softer to eat. A very little apple jelly, or other bright jelly, added to chocolate glacé makes it shine better.

Marzipan and Almond Icing.

Boil 2 lbs. sugar in ½ pint of water to over 300°, say 310°; when the sugar has had enough boiling, take off fire, and then beat in slowly 1 lb. almonds. This paste should be worked (by a machine, if you have one) very smooth.

Berlin Buns (Dough Nuts).

Make a dough with 2 lbs. flour, 1 lb. 2 ozs. water or milk, 1 egg, ¼ lb. butter, ¼ lb. sugar, and 2 ozs. yeast; rub the butter into the flour, and make the whole into soft dough. Let it ferment for four hours, then weigh into 2 oz. pieces, roll round,

press thumb into middle, put into hole ½ teaspoonful of preserve, close it over by pinching tightly the dough up over and around it. Let prove for about quarter of an hour, then have ready some good boiling fat, and drop the buns into it, and cook until light brown; take out, drain, and roll in castor sugar.

> *Note.*—To test if the fat is hot enough for cooking purposes sprinkle into it a drop of water; if hot enough, it will reject the water instantaneously with a spluttering kind of sharp report. The reason for heating fat to this state is that it shall have given up all its moisture, and be so that the moment the article to be cooked is put into it the outer surface is set, and the fat cannot then penetrate into it. If the fat is not hot enough the article absorbs it and is soddened with fat, tastes greasy, and is bilious and not crisp. Be careful to stand away from the boiling fat when splashing in the water, for when rejected its flying particles will scald.

Tartlettes aux Rhum.

Line a tartlet pan with one of the sweet short pastes; cut out thin, and fill with this mixture: Beat up 18 yolks with 6 ozs. sugar, ¼ lb. ground almonds, 1 oz. flour, 1 rind of lemon grated; then stir in 2 tablespoonfuls of rum, 6 ozs. melted butter, bake carefully; when baked, turn upside down on to a sieve; when cold, spread top with apricot preserve, glaze thinly with white fondant, and place half a blanched almond on top.

Christmas Puddings.

Take 1 lb. breadcrumbs, 1 lb. beef suet, 1½ lbs. currants, 1 lb. raisins, ½ lb. sultanas, ¼ lb. lemon-peel, ¾ lb. moist sugar, 2 tablespoonfuls flour, 1 grated nutmeg, about two-thirds pint of milk, and 4 eggs. The raisins carefully stoned, the sultanas and currants quite free from stalk and grit, the suet and peel chopped *very fine;* the flour, breadcrumbs, sugar, and grated nutmeg should be placed all together in a pan, and mixed in their dry state. Whip the eggs in another vessel for a minute, mix with the milk, pour upon the other ingredients, and amalgamate the whole; put into buttered basins or moulds, fill quite up, make a thin paste (scrapings of pudding-pan and flour will do), and spread this over the top of the puddings. Lay note-paper upon the paste, cover the pudding with a cloth, tie it down securely, and boil it steadily six or eight hours. When done, take out of the water and let it stand five minutes, then cut off the top, turn out upon its dish, add sauce, and send to the table.

Note.—If quite sure of the taste or palate of the probable

eaters, add, when mixing, the usual glass of brandy, and enough ordinary mixed spice to cover a penny its own thickness; this gives rather a coarse flavour, and (as we have said in another place) is quite a matter of taste. Do not boil violently ("gallop"), but gently, and always err upon the side of cooking too much rather than too little, because the object is not only to cook the ingredients, but to bring out their flavour, and also to give that dark colour which is generally supposed to indicate richness.

Mincemeat.

4 lbs. raisins stoned and chopped fine, 4 lbs. currants, 4 lbs. sultanas washed, picked, and chopped, 4 lbs. apples picked and chopped, 2 lbs. tripe and 4 lbs. suet chopped fine, 2 lbs. mixed peel chopped fine, 4 lbs. moist sugar, 1 nutmeg grated, 1 oz. powdered cinnamon, 1 pint strong brandy. Chop the apples with the fruit—it will prevent them sticking so much. When chopping the suet, avoid the use of flour if possible; also keep it from binding in a soft mass, keep it cool, and chop in small quantities. Mix all together, and keep in stone jars.

Calves'-feet Jelly.

Calves' feet are generally to be obtained from the butcher ready for boiling, but if it is not convenient to get them ready dressed, scald them with boiling water, leaving them in it a minute; then scrape the hair off, knock off the hoofs and split the claws, and take out all the fat to be got at, then wash them very carefully; put four feet to a gallon of water and boil down gently to about half, strain it, and let it get cold; then take off all the fat. After you have scraped as much as possible off, pour a little boiling water upon the top, shake it about, and then pour it off quickly. After you have done this, take some thin tissue or some blotting-paper and dry the top of the jelly; then turn it out, and if there is any sediment at the bottom scrape it off also. This will leave about two quarts. Put this into a clean stewpan, with the juice of three lemons strained, some thinly cut shavings from the rinds of the lemons, $\frac{3}{4}$ lb. loaf sugar, a gill of white wine, the whites of 6 eggs beaten for a minute, throw in the shells also to help to clarify, and 2 ozs. good gelatine. Put this on a cool part of the hot plate, or on a slow fire, and stir gently until it boils and begins to rise. When this point is reached, do not stir any more, but draw it a little on one side, and as the scum is thrown up by the boiling, remove it carefully. Do this for about a quarter of an hour, then draw still farther away from the fire, and allow it to settle for another quarter of an hour. Now dip the jelly-bag in

hot water, wring it out, and strain the jelly through in a basin. If the jelly, on account of some mismanagement, is not quite clear, strain it again. If it should be wanted rather richer, add a little sherry when boiled up the last time, and when strained keep it in a basin for future use, or run it into earthenware or glass jelly moulds, not metal, for fear of discoloration.

Penny Spice Cakes.

3 lbs. stale cakes rubbed through sieve, 3 lbs flour, 1 lb. fat, 1 oz. spice, 1 oz. ginger, 2 lbs. moist sugar, 1 oz. ammonia; rub these all together fine, then add 6 eggs and enough milk to make a firm but workable dough. Pin out sheet a quarter inch thick, cut out with 3-inch cutter, wash over, lay half a blanched almond on top, and bake.

Tea Biscuits.

14 lbs. soft flour, 3 lbs. moist sugar, 3 ozs. ammonia, 3 pints milk, ¾ lb. fat, rub together; add milk to make a light dough, pin out a quarter inch thick, cut with 2-inch cutter, and bake in sharp oven.

Dessert Sandwich.

Rub 14 ozs. flour with 10 ozs. butter and 3 ozs. sugar, add 4 yolks and a spoonful of milk, and make into a smooth dough; then make a paste confection for spreading by beating 3 ozs. butter and 5 ozs. sugar: add and mix well five yolks, 3 ozs. ground almonds, about half a gallipot of best cake crumbs (almond, Genoese, or sponge) moistened with a spoonful or two of milk; roll the short paste into a sheet a quarter inch thick, cut out with a round cutter (2-inch for twopenny sandwiches, 5-inch for sixpenny), lay upon baking tin and wash over with milk, spread thickly with the confection, but not too near the edges; cover with another round, fasten the outer edge and bake in a cool oven. When baked, spread with preserve, and mask either with fondant or meringue; ornament with fine tracings in fondant sugar and red currant jelly. To make either fondant or currant jelly pliable for ornamenting, put some in a paper cone and in a warm place a minute to melt.

Dessert Baskets.

Make a paste with 8 ozs. fresh butter, 8 ozs. ground almonds, 8 ozs. sugar, 6 ozs. flour, 6 drops essence of almonds, 4 ozs. cut dried cherries, and 2 ozs. mixed angelica; rub all finely together and wet up with yolk of egg into rather soft dough; fill with this paste, small shallow canoe-shaped tins about 3 inches long, 1½ broad and ¾ deep, and with sloping sides; bake in a fairly hot

oven. When baked, cut the top off in a thin slice, cut it in halves to represent the basket covers, scoop a little out of the top of the cake after the cover is off, bend across, and well fasten in the sides a strip of angelica to form the handle; smear the inside that has been scooped out with preserve, pipe in some whipped flavoured cream, pipe up buds of the cream in front, so that when the lids are put on they will stand two-thirds open and resting up piped cream; put a bloom on to the cream buds by a spray of carmine thrown from the stiff bristles of a carmine dipped brush, which will be easily effected by drawing a knife edge across the bristles towards the person, the brush being close to the cream; cover the lids with red currant jelly and lay them in position, which will bring the round point midway between the handle and the part of the cake it was cut from, and the two cut ends nearly or quite touching at the bottom of the handle. Now group some small or cut crystallised fruit on the join of the half lids at the bottom of the handle, also minute pieces of glacé cherry, angelica, and a silver dragee or two around the front to set off the white of the cream buds; the sides or some of the baskets can also be smeared with preserve, and covered in roasted cake crumbs, or roasted cocoanut, if preferred, for variety.

Royal Dessert Rusks.

½ lb. finely-cut citron, ¾ lb. desiccated cocoanut, ¾ lb. flour, ¼ lb. fat, ¾ lb. sugar, 6 eggs, and 10 drops essence of vanilla; well beat the whole, and pour on to a well-buttered tin, with edges, to prevent running off; spread not quite an inch thick, and bake in a cool oven. When quite cool, cut as fingers for ordinary rusks, only smaller, and toast well in a sound oven.

Apricôs.

With a 2-inch diameter round cutter, cut out some pieces from a sheet of Genoese an inch thick, slice them and spread them with crimson apricot jam, sandwich them, pipe on top with meringue to represent an apricot, dust with fine sugar. Put in oven a minute to set, then stand on wire sieve over a bowl, and pour over warm crimson apricot syrup—see how to make—let it run freely off the meringue, but make the sides moist enough for cocoanut to adhere well; lift from the sieve on to pale brown roasted desiccated cocoanut, and with a knife draw it up the sides until covered. Put a sprig of angelica to represent stalk of apricot.

Note.—The apricot is also piped on with boiled meringue, and dusted with sugar, but not put in oven. The sides only are covered in pulp and cocoanut, the meringue on top

is then delicately sprayed with carmine to represent bloom by dipping a tooth brush into carmine, holding it towards the meringue, and drawing a knife over the bristles towards the person holding it, which has the effect of throwing a shower of red spray towards the article by the rebound of the bristles. A dot of burnt sugar is put at one end for eye, and at the other a strip of angelica for stalk.

Petit Four Framboise (Raspberry)

is one inch Genoese, cut into one and a half inch squares, sandwiched and masked in thinned acidulated raspberry jam, then dipped (top and sides) in raspberry fondant, stood to drain upon wires, and then the top ornamented alternately with white icing and red currant jelly in thin lines.

Lemon Filling for Cheese Cakes.

½ lb. of castor sugar, juice of 2 lemons, 2 ozs. butter, 3 eggs, and the grated rind of 2 lemons. Whip the eggs a little, and place with other ingredients into stewpan; stir and simmer till it thickens; do not let it boil.

Chocolate Filling, etc.

Mix 2 ozs. flour with a pint of milk, add 6 ozs. sugar, 2 ozs. unsweetened cocoa powder or confectioners' chocolate, and 3 eggs. Mix all well together into a stewpan; place it on the fire, stir it until it thickens; do not let it boil; take from the fire, pour into bowl, and then stir in a teaspoonful of vanilla essence.

Small Fancy Creams.

Make a sweet short paste by mixing 1 lb. fine flour, 4 ozs. castor sugar, 10 ozs. fresh butter, and 2 eggs into a smooth, firm paste; roll into a sheet the thickness of a penny, cut out with a 2-inch diameter round cutter. Prick them to prevent bulging; place on tin, and bake well; don't burn. Prepare a custard with ½ lb. castor sugar, 6 yolks and a quart of milk, by whisking all together over a good fire until it thickens; it must not boil; add 12 drops essence vanilla and 1 oz. soaked gelatine, and when nearly cold beat the whites of 3 eggs to a stiff snow, and stir them into the custard; pour into small ornamental wet moulds only large enough for one lady; put them in a cool place to set. When required, turn out by dipping in warm water the usual way. Place one on each piece of sweet paste previously spread with crimsoned acidulated apricot; pipe neatly with red currant jelly. Should sell well at the counter.

Presburg Zweeback.

Make a rich rusk by fermenting ½ lb. sugar, ½ pint warm milk, 2 ozs. yeast, 4 eggs, and a handful of flour for two hours; then melt 4 ozs. butter, pour into the ferment, and make a fairly firm dough with fine flour. After half an hour, mould into long rolls of about two inches in diameter, flatten down a little, put into narrow square tins, if you have them—if not, in the narrowest French roll tins you have; prove well, bake well, cut into slices a quarter inch thick, and toast to a light brown; mix ½ lb. ground almonds and ½ lb. sugar into a paste with yolk of egg thin enough to spread with a knife; spread each rusk thinly with this mixture, put them into oven to brown the paste, and then in the drying oven until quite crisp.

Brioche Halfpenny Loaves for Shop Sale.

1½ lbs. fine flour, 5 ozs. good butter, 5 ozs. castor sugar, 1 oz. cream of tartar, ½ oz. carbonate of soda, 2 eggs, not quite a pint of milk, and a pinch of salt. Mix the same as for soda scones; weigh into 1 lb. pieces, break each piece into ten or twelve; make into small cottage loaves, stand upon tins, wash over with yolk, and bake half an hour.

Indianas.

Prepare the following mixture: Stir 12 yolks with 6 ozs. sugar, whip up 14 whites to a firm snow; mix these together, adding carefully ½ lb. flour and 1 tablespoonful of water. Pipe as buttons, the size of a penny in diameter, on to paper, and bake very dry. Hollow out a little from the flat side; spread what remains of the flat side with preserve, also smear a little on the part hollowed out. Now place them together—it will then represent a ball more or less—cut off a little from one of the round ends to make it stand; make a hole through the part which has now become the bottom. Having now got the two halves hollowed out and fastened together, and one part with the piece cut off to make it stand, and a small hole through this part, dip it with the round and uncut top into coffee, chocolate, or raspberry fondant, covering it right down to the part that is cut off; stand it upon the cut part on a wire, and put inside the oven for a few seconds to make it shine; allow to cool, and then take them between thumb and finger of the left hand, and from a bag fitted with a pipe, in the right hand force cream, whipped, flavoured, and sweetened, through the hole in the bottom into the hollow part, and put cut off piece over the hole.

Honey Gingerbread.

2 lbs. flour, 12 ozs. sugar, 4 ozs. each of finely minced lemon, citron, almonds, and butter, a pinch each of cinnamon, nutmeg, and mixed spice, 1 lb. honey, ½ oz. carbonate of soda, and a gill of water. Put the honey with water into stewpan, bring to boil; rub the butter and other ingredients into the flour, make a "bay," pour in the hot honey and water, and make a smooth dough; roll it half an inch thick, place upon tin, let stand one hour, and then bake in cool oven. When baked, pour over it very thin vanilla fondant, and cut into shapes.

Germ Meal Dessert Biscuits.

2 lbs. germ meal, ½ lb. ground almonds, 12 drops essence of almonds, 1 lb. butter, 1¼ lbs. sugar, and enough eggs to make it into a firm smooth dough; roll out very thin, cut with coffee biscuit cutter or fancy cutter, and bake quickly in sound oven.

Lemon Rings.

3 lbs. flour; make a "bay," put in 2½ lbs. sugar, ¾ lb. margarine, cream them up; add 5 eggs, essence of lemon, ¼ pint milk, mix, cut out with 1½-inch cutter, with a smaller cutter cut out middle, and bake on tins in sharp oven.

Almond Drops.

4½ lbs. flour, 1¼ lbs. margarine, ½ oz. powder, 5 lbs. sugar; rub together, make a "bay," add 15 eggs, essence of almonds, roll in long finger strips, cut off in ½-inch pieces, stand on ends half inch apart, and bake on tins in a cool oven.

Gâteau de Macaroon.

Mixture: 1½ lbs. ground almonds, 2¼ lbs. sugar, 12 whites of eggs well beaten, and must be only stiff enough to force through savoy bag; add 3 ozs. flour, and the juice of two lemons. If the mixture is too stiff, add another white of egg. Cover a tin with rice (wafer) paper, draw three circles, about 8 to 10 inches diameter, spread each circle with macaroon half inch thick quite level; pipe a fourth circle with tube a nice design, then bake carefully. When cold, glaze each circle, except the top, with firm boiled apricot, coloured red. The top circle glaze with hot strong syrup to make it shine; do this as soon as it comes out of oven, put the top circle on the others, and decorate between the piping with red and yellow apricot and glacé fruit; bake a few macaroons very small, with glacé cherry, etc., in middle, and stick them round the top. Edge and finish it off round the side by thin almond icing neatly fastened on them; chop some

blanched almonds fine, brown them in the oven, and while very hot roll them about in a little hot clear syrup to make them shine, and then roll the side of gâteau in them to cover the almond icing. Put this almond icing and the browned almonds on before putting the edging of small macaroons on.

Gâteau Mocha and Coffee Cream.

Mixture: Make a cake batter by stirring ¼ lb. sugar with 2 yolks; whip four whites to a firm snow and stir it into yolks with ¼ lb. flour and few drops essence of vanilla and spoonful of rum, and bake in a buttered papered hoop. When baked, turn upside down on a sieve till next day. Then cut in three slices from side to side, not top to bottom, and sandwich together with mocha cream, prepared by slightly warming ½ lb. fresh butter and stirring into it 1¼ lbs. icing sugar and strong essence of coffee. Prepare the coffee essence by boiling ½ lb. best coffee in a pint of water for quarter of an hour. (Bottle the remainder for future use.) The coffee cream, when finished, must be stiff, and stand up like icing when sandwiched together with this; cover the cake with it thinly, and smooth with knife; brown, glaze, and chop almonds as in preceding recipe, lay them with a knife up the sides of the cake thinly, put some of the cream into a small star tube, and pipe a design upon top.

PICK-ME-UPS.

1. PUT ½ teaspoonful of ground ginger, ½ pint water, and teaspoonful of beef extract into stewpan, and make hot, add ½ pint of good old claret and boil up, season to taste with salt—sugar can be used for a change; let it cool down a few degrees and then whisk 2 yolks of eggs. Drink slowly from a spoon.

2. Put 1 lb. of the coarsest oatmeal into 3 or 4 quarts of water, boil for a few minutes, stir in teaspoonful beef extract, season well with pepper and salt, let get quite cold, and drink a small teacupful occasionally during the night's baking.

3. Crush 1 lb. of red currants or strawberries, add 2 quarts water, juice of 1 lemon, ¼ lb. sugar and ¼ ounce carbonate of soda; let stand one to twelve hours, strain, put on ice, and drink half a glass when thirsty.

4. Add to 4 quarts of boiling water 1 oz. ground ginger, a pinch of cayenne, 4 drops essence of lemon, a pinch of tartaric acid, 1 lb. sugar; when cool, bottle. Drink either hot or cold. It is very stimulating drunk quite hot.

5. Take ½ lb. cold meat—not gristle—chop up and pound it fine, boil and add a sheep's brains, season with salt and pepper,

stir in 1 good-sized onion, chopped fine, and yolks of 3 eggs; boil ½ lb. rice nice and dry, add 1 oz. of butter and a little grated nutmeg; put into a shallow dish, spread the minced meat upon it, drawing the rice up over it; then bake in a moderate oven. Eat with cauliflower and potatoes.

6. Roast a chicken; cut all the meat off and free from skin and hard pieces, put into a stewpan with ½ pint of water, a teaspoonful of beef extract, 2 cloves, an onion, and sweet herbs; stew half an hour, take out the meat and strain the liquor; put the meat and strained liquor back into the stewpan, with 1 oz. butter, the juice of half a lemon, a pinch of salt, and a gill of milk; simmer and stir for a few minutes, and eat with dry toast (or wholemeal bread), potato, and cauliflower.

7. Put in a stewpan 6 ozs. macaroni and a pint of water; boil slowly one hour, drain off the water, add 2 ozs. butter and 4 ozs. of grated Parmesan cheese, mix a tablespoonful of flour in a pint of milk, with a pinch of salt, and 2 or 3 grains of cayenne; stir the whole together, put into a buttered dish, grate 2 ozs. more cheese over the top, and put into oven to brown for a quarter of an hour.

Invalids' Jelly.

1. Toast ½ lb. of the crumb of wholemeal bread, place it and its crust in a stewpan with 1 quart of water, and boil slowly for an hour. Pass it through a hair sieve, add sugar to taste (about 4 ozs.), ½ pint good port, juice of 2 lemons, 2 ozs. dissolved gelatine. Mix well and put into small moulds.

2. Place in a stewpan 1 oz. beef extract, a pint of water, 4 ozs. sugar, the juice of 2 lemons, a very small piece of cinnamon, and simmer till beef is dissolved; melt an ounce of gelatine, stir it into the cooling extract, add ½ pint sherry, and strain into small moulds to be used as required.

Ginger Beer.

Pour 6 quarts of boiling water upon 1 lb. sugar, 2 ozs. bruised ginger, and a pinch each of tartaric acid and cream of tartar; stir up and leave for six hours. Then stir in a tablespoonful of liquid yeast, and 1 whisked egg white; let this work for twelve hours, strain and bottle, tie the corks, and lay on side. It will be ready in twenty-four hours.

Gingerade.

Well dry and mix 2 lbs. of fine or pulverised sugar, ½ lb. tartaric acid, ½ lb. carbonate of soda, ½ oz. ground ginger, 12 drops essence of lemon; keep in an air-tight bottle, and use a full teaspoonful of the mixture to a glass of water.

BAKING POWDERS FOR BAKERS' AND CONFECTIONERS' USE.

When making these powders and flours, if for storing, use maize starch, which will prevent them becoming lumpy. Moisture destroys their power by decomposing and liberating the gas. Tartaric acid is about double the strength of cream of tartar. It effervesces very quickly. It will generally be found to neutralise carbonate of soda better in equal quantities, or if used with sour milk for scones the acid in the milk must be allowed for—say, five parts soda to four parts acid. Cream of tartar will neutralise half its own weight of carbonate of soda. Those who clearly understand this principle will have no difficulty in making up any quantity of powder. If the goods look yellow and smell strong, there is too much soda or too cold an oven, and more acid must be added to the powder. If they have smooth, shining, and slightly slate-coloured surface or edge, you will probably find it is caused by an excess of acid. It will taste sour, and the powder must have more carbonate put to it.

RECIPES.

I.—Baking Powder.

2 lbs. cream of tartar; 2 lbs. tartaric acid; 4 lbs. carbonate of soda; 1 oz. of ammonia; 4 lbs. maize starch. All particles of carbonate and acid should be powdered, the whole of the ingredients well mixed up together, and sifted through a hair or other fine-mesh sieve; pack and keep from damp. For scones, use ¾ oz. to 1 lb. of flour.

II.—For Good Self-raising Flour.

Well mix together the whole of recipe 1 (minus the starch), with 280 lbs. of dry roller whites, slightly granular preferred. When the flour and baking powder are mixed together, sift through a fine sieve to make sure it is thoroughly amalgamated. Keep from air and damp.

III.—Scone Flour.

40 lbs. flour; 1½ lbs. cream of tartar; ¾ lb. carbonate of soda. Mix as before, and it is ready for use.

IV.—Bakers' Prepared Flour for Cakes.

15 lbs. flour; 4 ozs. carbonate of soda; 2 ozs. cream of tartar; 2 oz. tartaric acid. For ordinary cakes use ½ oz. to 1 lb. of flour.

V.—Baking Powder.

1 lb. maize starch; 1 lb. carbonate of soda; 6 ozs. tartaric acid; 1 lb. cream of tartar. Mix as before; use as No. 1.

N.B.—Maize starch is used in these recipes for the only purpose of keeping dry. Moisture, of course, has a destructive effect on baking powder.

Hot Plate Cream Scones.

8 lbs. flour, 12 ozs. fat, 6 ozs. sugar, 4 ozs. cream of tartar, 2 ozs. carbonate of soda, 2 quarts milk. Mix the same as for ordinary scones. Pin out round the size required, wash over, put on hot plate, turn over as soon as set.

Tea—Butter Biscuits.

8 lbs. flour, 3 lbs. fat, ¼ lb. sugar, 1½ ozs. salt, 2 ozs. cream of tartar, 1 oz. carbonate of soda. Rub these together, and make into a nice smooth dough with water. Mould and pin out the size required; place on baking sheet and bake.

(2) Abernethy.

8 lbs. flour, 3 ozs. ammonia, 1 lb. fat, 1½ lbs. sugar, and 2 ozs. caraway seeds. Make into smooth dough with water; mould and pin out, put upon baking sheets, and bake in sound oven.

(3) Abernethy.

8 lbs. flour, 1 lb fat, 1 lb. sugar, 2 ozs. cream of tartar, 1 oz. carbonate of soda, 1 oz. salt, 1 oz. caraways. Rub together and make into a rather soft dough with water. Mould, pin out, put upon baking-sheet, and bake.

(1) Halfpenny Biscuits.

8 lbs. flour, 1 lb. fat, 6 ozs. sugar, 1½ ozs. salt, 2 ozs. cream of tartar, 1 oz. carbonate of soda. Rub together and make into firm dough with water. Mould, pin out, put upon baking-sheet and bake. *Competition and common-sense mixed together will arrange the quantity of dough to be given for the halfpenny.*

Scotch Albert Biscuits.

9 lbs. flour, 1½ lbs. fat, 1¼ lbs. sugar, 2 ozs. cream of tartar, 1 oz. carbonate of soda. Rub together, and make into a smooth dough with either milk or water; cut out to suit according to price charged, small if sold per lb., or for farthing or halfpenny the size to fit.

Parkins.

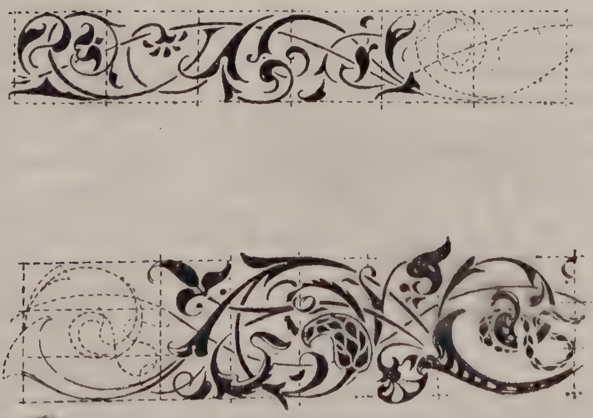
4 lbs. flour, 4 lbs. fine oatmeal, 4 lbs. syrup or treacle, 1½ lbs. sugar, 2 ozs. mixed spice, 1 oz. ginger, 4 ozs. cream of tartar, 4 ozs. carbonate of soda. Mix together. If too dry and firm use a little water. The dough should be firm enough to allow of moulding up and pinning out into thin rounds, or cakes, of about four inches diameter. Wash over, and place on top a split almond. Wash over with water; bake in a cool oven.

(2) Ginger Nuts.

4 lbs. flour, 1½ lbs. sugar, ¾ lb. fat, 1 oz. ginger, ½ oz. mixed spice, a pinch of cream of tartar and carbonate of soda, 20 drops essence of lemon, and 2½ lbs. syrup or good treacle. Mix into smooth dough, cut out, place on baking-sheet, wash over with water, and bake in a cool oven.

A Commercial Paste

for small pork and mutton pies: 8 lbs. flour, 2 lbs. fat, 2 ozs. salt, 2 ozs. cream of tartar, 1 oz. carbonate of soda. Make into a rather soft dough with water.



Copy for Piping Practice.

SCIENCE.

Science is intimately a part of, and bound up with, all branches of industry. It can be demonstrated by the plain logic of fact that it is an indispensable factor in the development, prosperity, and commercial success of the industrial life of the civilised world.

By its aid matter has been resolved into its ultimate elements, which by skilful rearrangement into different combinations have been transformed into numerous compounds for the use and service of men.

The wonder-working results of scientific research have been carried into the workshop and factory, bringing enlightenment and instruction to master and men, teaching by simple demonstration the causes of what were once only known by effect. Under its guidance the guesswork operations of the humblest craftsman have been illumined, and facts hitherto obscure and mysterious have become clear and simplified, enabling him to graduate from a state of "rule of thumb" ignorance to that wherein he can truly claim to possess a fuller knowledge of the scientific, and therefore exact, facts which control his work.

Chemistry.

There are few trades that have benefited more by the assistance afforded by knowledge of chemistry, or from a study of its teaching, than that of the baker, the miller, the caterer, or the confectioner.

In each of these cases, the essential factor in the successful manipulation of the raw material employed is the chemical change without which the proper production of their goods would be an impossibility. It is due to a proper scientific appreciation of the way in which these changes operate that a student or workman will realise that once these chemical changes have been, so to speak, set in motion, there can be no going back, no possibility of alteration or rearrangement of the raw materials, and that if an initial mistake has been made the goods are wholly or partly spoilt, and must remain so, as they cannot be made up again.

It is for this reason that the study of chemistry of wheat, and the other raw and prepared materials used, as well as an exact acquaintance with the laws which govern their successful manipulation, is particularly valuable, and should be acquired by everyone desiring to become an accomplished and competent member of the trade.

The matter and tables which follow are appended with a view to encouraging the study of at least those branches of science which deal with material employed in our trades.

Notwithstanding the objections which have at times been raised by some of the less intelligent and slothful among us, that an acquaintance with science will not bring with it a commensurate return in increased wages, it is certain that everyone possessing such knowledge is the richer and better for it. The progressive apprentice and student should study the text-books on organic and inorganic chemistry, for they will not fail to see that they will, directly or indirectly, benefit by so doing.

Heat and Temperature.

The term "heat" is employed to express a sensation we experience in relation to ourselves and the substances we come in contact with, as well as to indicate a condition of them. Scientifically speaking, "heat" has no substance, and may be defined as *a condition* of matter, wherein the material particles composing it are subjected to the vibratory movements caused by that force. It is according as these vibrations are accelerated or diminished that a substance becomes hot, hotter, or cooler.

It is doubtful if the expressions "heat" and "cold" are not misleading terms, as both appear to refer to one and the same condition, and only serve to convey an idea of two extremes of that condition of a body.

Our everyday notions of heat and cold are really only relative, and being based upon the temperature of our own bodies, which not only varies in the individual, but differs considerably in different persons, are liable to serious error, and cannot be regarded as safe guides in any operation involving a certain temperature or degree of heat.

Of two persons both touching an article at a fixed temperature, one will consider it to be "hot," while the other one pronounces it merely "warm." One person sitting in a room will say it is cold, and another on entering it after walking remarks that it is very warm. In the first place, the different appreciations are due to the temperature of the hand of the first person being lower than that of the second, and in the other instance, the temperature of the first individual, possibly owing to having remained in one position for some time, has become reduced, while that of the other, as a result of exercise, is much higher. Let us consider another instance. To one of two persons whose blood is at different temperatures, who placing their hands in a bowl of water, the latter will appear cold, the other experiencing a sensation of warmth. These different results, it will be apparent, are

arrived at according as the water adds to, or takes from, the heat of their hands.

Q. Is the use of a thermometer and oven heat-registering apparatus by bakers, cooks, and confectioners imperative?

A. It cannot be said to be imperative, but the baker who does not employ it is very like a man who, wilfully ignoring the candle provided for his convenience, enters a room in the dark in search of something. He strains every faculty in his endeavour to find it and to prevent injury to himself and the furniture, and in the end may not only be unsuccessful, but is rewarded with a pair of barked shins.

Without a thermometer either of these tradesmen is groping in the dark.

In the language of science, heat is the sensation experienced on touching something of a higher temperature than that of the blood of the person touching it. If you touch a piece of iron, or anything of a lower temperature than your hand, you say it is cold; if it is higher in its temperature than your hand, you say it is "warm," "hot." These terms do not convey a definite fact, and therefore are incorrect. For instance, two persons whose blood (flesh) is at different temperatures, upon putting their hands into a bowl of water, will each record a different sensation. The water will appear to each to be of a different temperature, "hotter or colder," according as it adds heat to, or takes heat from, their hands. Heat—the cause of the sensation of heat—is a condition diffused through all bodies. When ice begins to melt, there must be heat in it, or why does it melt? That is called *insensible* or *latent* heat, because the temperature of melting ice is not raised during its melting. On the other hand, heat which affects the thermometer is called *sensible* heat, because it can be seen by the thermometer records.

Specific heat is the quantity of heat required by similar quantities of different bodies to heat them equally. *Convection or conveying* of heat, *conduction* of heat, and the *radiation* of heat denotes the modes by which the equilibrium of heat is effected, viz.: If heat, being generated, impinges upon a substance which conducts it, by the substance taking the impact, and by the properties of which it is composed conducting it through its substance, molecule by molecule, as it gets heated, passing it on to the next molecule, and so on through the whole mass, it is said that the heat is conveyed from one part to another by the law of conduction; if heat is conveyed by currents, it is by the law of convection; and if heat is absorbed by a body, and does not pass it onward and through its substance, then the heat so absorbed, if given out again, is by radii or rays, and these rays of heat falling upon other substances are reflected, and transmitted

again by them or retained by them. This is the law termed *radiation* of heat. Bricks and tiles built into solid substances, such as bakers' ovens, absorb the heat from the fire, and give it off again by radiation; if built of iron or metal, the oven is heated chiefly by conduction; but convection, conduction, and radiation, in most every-day instances of heat transmission, may be considered as each being a modification of the other.

Temperature is the comparative degree of *active* heat accumulated in a body as measured by an instrument such as a thermometer, or by its effects on other bodies.

Temperature must not be confounded with the quantity of heat there may be in a body, A pint of water at 212°, and a gallon at 212°, will both of them be at the same temperature, degree of heat, but the gallon will contain a larger quantity of heat, by reason of the fact that there is more of it. Example: If one gram of water, at 0° C., requires one unit of heat to raise its temperature one degree to 1° C., then to raise one gram of water to 100° C. will require one hundred units of heat; and if one gram of water requires one unit of heat to raise its temperature one degree, then to raise one hundred grams of water one degree will require one hundred units of heat, and therefore the hundred grams at 1° C. will contain ninety-nine more units of heat than the one gram at 1° C. (ninety-nine times more heat), though the one gram and the one hundred are both at the same temperature of 1° C.

The Thermometer.

Literally, a *measurer of heat;* an instrument for comparing the degree of active heat existing in other bodies, by its effect in expanding a column of mercury.

Fahrenheit's Thermometer.—That arangement of the scale of the instrument in which the space between the freezing and the boiling points of water, under a medium pressure of the atmosphere, is divided into 180 parts or degrees, the freezing being marked 32°, and the boiling 212°. This scale was adopted by Fahrenheit, because he supposed, erroneously, that 32 of those divisions below the freezing point of water (which was therefore 0 on his scale) was the *zero*, or greatest degree of cold.

Centigrade Thermometer.—This is the thermometer of Celsius, which is used in France, and is the most convenient in practice: it consists in that arrangement of the scale in which the freezing point is marked 0, or *zero*; and the boiling point, 100.

Reaumur's Thermometer.—In this scale the freezing point is marked 0, or *zero*, and the boiling point 80°. The degrees are continued of the same size, below and above these points, those below being reckoned negative.

These different modes of graduation are easily convertible: the scale of Centigrade is reduced to that of Fahrenheit by multiplying by nine and dividing by five, and adding 32°; that of Reaumur to that of Fahrenheit by dividing by four instead of by five; or that of Fahrenheit to either of these, by reversing the process. Thus:

C. $100^\circ \times 9 = 900 \div 5 = 180 + 32^\circ = 212^\circ$ F.
R. $80^\circ \times 9 = 720 \div 4 = 180 + 32^\circ = 212^\circ$ F.

Or, by reversing the order:

F. $212^\circ - 32 = 180 \times 5 = 900 \div 9 = 100^\circ$ C.
F. $212^\circ - 32 = 180 \times 4 = 720 \div 9 = 80^\circ$ R.

A Table is added, showing the correspondence of the three thermometers.

Fahrenheit.	Centigrade.	Reaumur.
212	100·	80·
200	93·33	74·66
190	87·77	70·22
180	82·22	65·77
170	76.66	61·33
160	71·11	56·88
150	65·55	52·33
140	60·	48·
130	55·55	43·55
120	48·88	39·11
110	43·33	34·66
100	37·77	30·22
90	32·22	25·77
80	26·66	21·33
70	21·11	16·88
60	15·55	12·44
50	10·	8·
40	4·44	3·55
32	0·	0·
20	—6·66	—5·33
10	—12·22	—9.77
0	—17·77	—14·22

Metrical Weights and Measures.

The Metrical System is based upon the (assumed) length of the fourth part of a terrestrial meridian. The ten millionth part of this arc was chosen as the unit of measures of length, and called a *Metre.* The cube of the tenth part of the metre was adopted as the unit of capacity, and dominated a *Litre.* The weight of a litre of distilled water at its greatest density was called a *Kilogramme,* of which the thousandth part, or *Gramme,* was adopted as the unit of weight. The multiples of these, proceeding in decimal progression, are distinguished by the employment of the prefixes *deca, hecto, kilo,* from the Greek, and the subdivisions by *deci, centi,* and *milli,* from the Latin :—

Standard: The Metre = 39·37 inches.

LINEAR MEASURE.

Decimetre,	$\frac{1}{10}$ or ·1 of a	Metre.	Decametre,	-	10 metres.
Centimetre,	$\frac{1}{100}$ „ ·01 „		Hectometre,	-	100 „
Millimetre,	$\frac{1}{1000}$ „ 0·001 „		Kilometre,	-	1000 „

CUBIC MEASURE—MEASURE OF CAPACITY OR VOLUME.

Standard: the Litre or cubic decimetre = 1·76 pints.

Decilitre,	$\frac{1}{10}$ or ·1 of a	Litre.	Decalitre,	-	10 litres.
Centilitre,	$\frac{1}{100}$ „ ·01 „		Hectolitre,	-	100 „
Millilitre,	$\frac{1}{1000}$ „ 0·001 „		Kilolitre,	-	1000 „

WEIGHT.

Standard: the Gramme = 15·43 grains.

Decigram,	$\frac{1}{10}$ or ·1 of a	Gram.	Decagram,	-	10 grams.
Centigram,	$\frac{1}{100}$ „ ·01 „		Hectogram,	-	100 „
Milligram,	$\frac{1}{1000}$ „ 0·001 „		Kilogram,	-	1000 „

It will be seen this is increasing and diminishing by tens.

Examples how to make the calculations: To multiply by 10, 100, 1,000, etc., move the decimal point one, two, or three places to the right, adding ciphers if necessary. Thus: 6·75—67·5, 675, 6750.

To divide by 10, 100, 1,000, move the decimal point one, two, or three places to the left, prefixing ciphers if necessary. Thus: 759·6876, 75·96876, 7·596876, ·7596876, ·0759687, etc.

Fermentation.—Certain changes of animal or vegetable substances, reduced to the moist or liquid state by water: The *Saccharine;* when the change terminates in sugar, as that of starch. The *Panary;* as that of flour forming bread. Or the

Vinous; as that of the grape, etc., forming wine, evolving alcohol. The *Acetous;* when the result is acetic acid or vinegar. The *Putrefactive;* generally of animal substances, evolving ammonia. Fermentation is a change, a splitting-up of matter with the formation of new products by living organisms called "ferments." The word fermentation refers alone to the action of these organisms. Fermentation is the name given to a class of decomposition undergone by a number of organic bodies in the presence of certain organised bodies of extreme minuteness termed ferments. All the kinds of fermentation at present known as such depend upon the existence and growth of minute organisms—these are the ferments; alcoholic fermentation is the change which sugar and other crystallisable substances undergo when subjected to the influences of a ferment such as yeast; whereby the sugar, etc., is converted into alcohol and carbonic acid gas. There are also formed small quantities of succinic acid and glycerine; the yeast also uses a fraction of the sugar and the crystallisable substances to build up its own structure. It is also said that the fermentation takes place at the moment when the cells of yeast cease to have power to freely consume the materials of their nutrition by the absorption of free oxygen or common air, and continue to live by utilising matter containing oxygen, which, like sugar or such other unstable substances, break up and produce heat by their decomposition. The living organisms develop living force by taking it from the oxygen and transforming it, or from the sugar, splitting it up and forming from it carbonic acid, alcohol, and other bi products.

Molecule (dim. of *moles*, a mass).—A minute particle of a mass or body. It differs from *atom*, in being always considered as a portion of some aggregate.

Atom (priv., to cut).—An ultimate particle of matter, incapable of further division.

Atomic Weights.—The law of definite proportions in chemical combinations. It is founded on the supposition that matter consists of ultimate indivisible particles, called *atoms;* that these are of the same size and shape in the same body, but differ in *weight* in different bodies; and that bodies combine in definite proportions, with reference to those weights, which are hence called *atomic weights.*

Reagent (*re*, again; *ago*, to act).—A substance employed in chemical analysis, for ascertaining the quantity or quality of the component parts of bodies, by *reacting* upon their elements. A substance that detects the constituents of a mixture.

Element.—The terms used in chemistry to denote a simple

substance—one not known to contain more than one kind of matter, *ultimate* element the last element into which a body can be decomposed, separated, or analysed.

Endosmosis.—The property by which rarer fluids pass through membranous substances *into* a space or cavity.

Exosmosis.—The property by which rarer fluids pass through *out of* such a space or cavity.

Water (H_2O).—A compound of hydrogen and oxygen in the proportion of two atoms of hydrogen to one atom of oxygen. It is a powerful solvent, and therefore water is never found in nature in a state of purity, and absorbs and holds the gases which are present in the atmosphere. It is estimated that nearly three feet of water, in the form of rain, snow, etc., fall upon the surface of Great Britain every year, being sufficient to average over fifteen tons per day to every individual, but if unused or allowed to remain stagnant may mean fever and undertaker, and should necessitate a constant supply, and no cisterns or tanks.

The total solid extract—mostly impurity—given by water analysis, when a sample has been evaporated to dryness, represented in best river water, is about three parts per 100,000; from deep wells—best—10 to 15; from chalk wells, 20 to 30. The appearance of water is no guide to the wholesomeness of its condition; crystal clear water is often made so by the chemical action of matter deposited in it. There are various standard processes by which the impurities of water can be ascertained. The oxygen process of Dr. Letheby seeks to determine how much oxygen is required to oxidise the organic matter contained in a sample.

The ammonia process of Professor Wanklyn—that of the quantity of free ammonia and chlorine—the combustion process of Dr. Frankland, etc., to determine the weight of organic carbon as undertaking the amount of organic matter contained, and whether animal or vegetable by the relative proportions of nitrogen and carbon. The degrees of hardness of water is estimated by equal grains present of hardening salts—carbonates, calcium, magnesium, etc. For each grain present estimate one degree of hardness. Ordinary temporary hardness is due to the presence of carbonates of calcium and magnesium, which are precipitated by boiling; but such boiling must be continued for some time—say quite an hour. The permanent hardness of water is due to the presence of sulphates—lime, magnesia—and is not altered by boiling. Carbonate of soda, added to boiling water, will decompose and precipitate these sulphates.

To soften water for bread-making or for culinary purposes, where

carbonate of soda cannot be used, mix one ounce of quicklime with every 30 gallons of water, dissolve, and well mix and allow to settle for twelve hours. The sediment will be ordinary whitening. If necessary, to ascertain the exact amount of lime required, mix a solution of nitrate of silver, using distilled water for the purpose; put a few drops into a white earthenware vessel—a gallipot will do—and add the hard water and lime in definite quantities until the faintest yellow tinge is produced. The measure of hard water and the weight of lime used will then determine the proportions necessary for perfect softening.

Ice, water, steam, superheated to vapour, are all the same thing—it is all water at different temperatures.

SUGAR.

There are several kinds of sugar, but only three which concern us or commerce generally, viz., cane sugar (saccharose), grape sugar (glucose dextrose), and what is called fruit sugar (lævulose). Cane sugar occurs in a large number of plants, but commercially is only manufactured from sugar cane, sugar beet, sugar maple, and sorghum, one of the palm-tree tribe.

Sometimes it is said that sugar made from the sugar cane is sweeter than that made from the sugar beet, but this cannot be so. From necessity, cane sugar, from wherever obtained, is absolutely the same substance, and if prepared equally pure and as well refined, has the same sweetening power. It, like all the cane sugars, is composed of the elements of C (carbon), H (hydrogen), and O (oxygen). These are united in the following proportions: $C_{12}H_{22}O_{11}$ as its formula. Cane sugar when heated in a solution with dilute acids, or when submitted to the action of yeast and other ferments, takes up the elements of water (H_2O), and splits into two molecules of grape sugar, viz., dextrose, so named because it has a right-handed power for polarised light, and lævulose, which is lævo-rotatory. Both of these have the same formula, $C_6H_{12}O_6$, but differ in their properties, doubtless owing to a different arrangement of the atoms or groups of ultimate particles of which the respective molecules consist. Starch also, when acted upon in the same manner, yields glucose, a grape sugar. These grape sugars are also called invert sugars because they invert the order of the rotatory action of the original cane sugar.

A short description of the manufacture of sugar will be useful knowledge in helping us to understand more about this important member of our raw material family. There are four processes in the preparation of the ordinary commercial sugar—

extraction of the juice, clarification and defecation, refining, and crystallisation. The sugar exists in the cells in a state of solution in the fluid which constitutes the juice or sap of the plant; this juice is extracted by pressure, by mill or press. This crude juice contains, besides sugar, water, earthy insoluble matter, albumen, wax, soluble colouring matter, and soluble salts. To prevent fermentation, the defecation process follows as quickly as possible after the expression of the juice. This is by defecating the juice with slaked lime or mono-sulphite of lime made into a cream, and added until the acids, acetic and lactic, in the sugar have been neutralised, then heat is applied, and when the process is completed (first by filtration and then by defecation) the juice is tapped off, and is then refined by allowing it to percolate through animal charcoal, which cleanses it from the colouring and other soluble organic matter. It is then evaporated by means of a vacuum pan, and caused to separate into crystals; the mother liquor that is left is drained off. When large grains are wanted for the market in the form of white crystals, the mass is put into a revolving perforated basket, and the centrifugal force due to rotation forces the loose syrup through perforations, while the large solid grains remain behind.

The first running of syrup from the first crop of crystals is reboiled and sometimes refiltered through the charcoal, and more crystals are formed, and this is carried on through second and third or more runnings, until the last syrup is so poor in sugar that difficulty is found in getting it to crystallise any more, and this final residue is the treacle and syrup of commerce.

This is a rough outline of a process (there are several modifications) more complicated than roller flour milling, and I have touched upon it chiefly for the purpose of pointing out that every succeeding formation after the first and second must be of a weaker and lower grade, and with the near approach to a certainty of there being some glucose in it, because after the length of time the operation has been in progress inversion will be caused by something, and whenever glucose is present the sugar is weaker in saccharine, and will also more easily decompose when being made up into goods, and the further also that these processes are carried on the more certainty there is of discolouring by contact with vessels in which it is carried on. These lower grades are characterised by more dust or powder, or these and small uneven crystals mixed in, and the whole "blued" like you blue your icing sugar, merely to add to its *apparent whiteness.* In using such sugar for fondant or boiled sugar goods is unreason, for the added mineral matter will have to be skimmed off as scum, and the glucose mislead by changing at a lower temperature than the best sugar, but it must be observed that it is

possible to buy highly saccharine sugars in a very impure condition. The char and the blood that are used to take out the colouring impurities also leave behind them some of their own compounds, and these have to be refined out as well, and sometimes this is not done perfectly. When choosing sugar, select an evenness of crystals (not large, and small and dust) with the palest shadow of brown, not a blue tinge.

Tests for purity and commercial value: For mineral matter and imperfect refinement, put 25 grams into a 100 c.c. graduated measure; shake occasionally till all the sugar is solved; if well refined, colourless, or but slightly cloudy—the imperfect, "yellow" brown, or nearly black—let remain undisturbed for twelve hours for mineral matter to deposit itself, and then read off the percentage. Test for glucose, simple and reliable. (See Dr. Barker-Smith's test in this book.)

Test for moisture: Weigh off 5 grams, place in a well-dried platinum dish, or one that will not break—but first carefully weigh the dish—place in oven at 140° F., and leave to dry for twelve hours; then weigh again—the loss in weight calculate as water.

Estimation of ash: Take the same quantity, moisten it all over with water, and then with pure sulphuric acid; heat this gently until frothing ceases, and then continue to burn to redness; take off gas, or out of the heated chamber, and moisten the sugar a second time with sulphuric, and let it burn again until the ash is quite white, then cool down and carefully weigh.

Confectioners' Caution.—Beware of non-sparkling sugar. Science has whitened, but not enriched it. It is safer to buy coarse granulation, rather than fine. Crystals are usually better than powder, though for some things, such as icing, a fine powder is necessary. But powdered sugar should always be looked upon suspiciously; sometimes it is not capable of a high form of crystallisation, and is mostly the re-refined refuse product of high-class sugars, and therefore pulverised sugar is unsafe to buy for best goods.

BUTTER AND FATS.

Simple Tests for Purity: Weigh 10 grams, and put in a graduated test tube, and melt by placing the tube in hot water; after a time the water and curd casein and the true butter separate into layers; the water remains lowest. The percentager of these can be read off in the tube. There should be not mors than 10 per cent. water, nor exceed in volume more than one-eighte

of the pieces put in. The curd should not be more than 5 per cent.

If butter has been mixed with much other fat, it will not froth, or only a very little. Place pure butter in a test tube or thin glass, and hold it over a gas jet, when it will froth the more and easier, the less water and salt there is in it. Place margarine in a test tube, and heat; it froths but little unless its butter percentage is high, but deposits its casein (if milk is used) and added matter, etc., which form at the bottom as dross, and can be estimated. Animal and vegetable fats melt, and remain as clear oil. Rub margarine and fats violently in your hands, and smell. Place a piece of candle-wick in fat, and a piece in sweet butter, then set them alight; the fat will smell more or less tallowy, and the butter buttery. *Try lard* the same way; the coarser and staler, the worse smell.

Lard is sometimes adulterated with cotton-seed oil. Put a piece into a porcelain dish, and make very hot over bunsen, and its smell will disclose its presence. This test is useful for most fats; heat separates, and the odour is plain.

Eggs.—Spots are caused by laying in one position a long time, therefore unpack and repack if necessary. The value of an egg is determined by its weight and freshness, breed of the fowl, and whether pickled or not. Pickling impoverishes the albumen. To the baker, an extra egg to the pound represents ninepence worth to the 120. Weigh eggs for your mixtures; do not count them.

Gelatine.—Coarse or fine, or sheet, should be tested each in the same way. Melt it, and make hot; and the nearer it approaches to glue or size in smell or taste, the worse it is: glue being the extreme boundary of badness, and isinglass the extreme boundary of goodness. Bad gelatine makes goods taste tainted.

Chocolates for bakers should be pure and unsweetened, and melt like butter when put into heat without admixture of water. Cheap chocolates are mixed with lower-grade cocoas, farina, sugar, etc., making goods coarse and of poor flavour.

Cream of Tartar ($KHC_4H_4O_6$) is a concrete saline, which separates from wines after full fermentation, encrusting sides of vessels with whitish grey and red crystals. The quality of it depends upon the amount of refinement it undergoes by filtration and crystallisation. The crude crystal is purified, and the value of the product depends largely upon the amount of impurity taken out or left in. Like flour, sugar, cloth, and hundreds of other things, cream of tartar depends for its quality upon the amount of money and labour expended upon its purifying process.

It dissolves very slowly, and therefore the gas evolved in the goods goes on until the goods in the oven are nearly baked.

Tartaric Acid ($H_2C_4H_4O_6$) is also another grape acid deposited from wine. It occurs in the form of acid tartrate of potash. It is very quickly dissolved when in presence of moisture.

Citric Acid is separated mostly as an article of commerce from lemons. It is also found in many fruits, gooseberries, etc. It is a vegetable acid like tartaric. Citric is a very wholesome acid.

Acetic Acid ($C_2H_3O_2H$) is a constituent of many organic bodies, and is one of the results of the decomposition and oxidation of almost all organic substances.

The acetification of fermented matter—matter which has undergone vinous fermentation, and wherein alcoholic fermentation has occurred—is readily attained by an exposure to the air of the fermentations at a slightly elevated temperature.

There are two potent factors at work upon these fermented matters to produce this acetification, namely: (1) an organism named *wycoderma vini*, which by its functions assists to produce this decomposition, and after assimilating some of the matter excretes acid; and (2) also by the oxidation of the alcohol by the oxygen of the air. There is no doubt that in very sour bread both of these forces have been at work, and although there is no doubt that the various acetous, lactic, vinous, butyric, and mucic fermentations are largely due to the work of organisms, there is also no doubt that acetic acid can be produced solely by the oxidation of alcohol.

On the one hand, it has been demonstrated that upon adding small quantities of ammonium phosphate to furnish N and alkaline and earthy phosphates, the atmospheric germs became fertile, and an alcoholic was converted into an acetic fermentation, this showing it was the work of organisms; and on the other hand, Buchen, Davy, and Döbercines demonstrated that the bringing of oxygen into intimate contact with alcohol, by passing (among other experiments) whisky and water through ozonised air, in a few minutes it was converted into vinegar, and factories were opened for the purpose of making vinegar by this means.

THE CARBONATES AND BICARBS USED BY CONFECTIONERS.

Bicarb. Soda ($2NaHCO_3$) is produced by a mixture of common salt (sodium chloride, NaCl), and sulphuric acid (H_2SO_4); being

heated together, the heat causes a decomposition represented by this equation :

$$2HaCl + H_2SO_4 = Na_2SO_4 + 2HCl.$$

That is, you see, a mixture of salt, sulphuric, and hydrochloric, and is the caustic soda of commerce. To make this into wholesome bicarb for food use, the solid salt cake (sodium sulphate) is again treated. The HCl is driven off, and the cake is mixed with coal slack and chalk or limestone (to form the carbon), and again heated ; the product again is then a carbonate, and after treatment with air then becomes wholesome bicarb soda. There is another process (but not so much in common use), by which carbonate of ammonia, common salt, and carbonic acid are mixed and heated ; these are decomposed, and form the new product.

Ammonia carbonate $2(NH_4)2CO_3CO_2$. It is a volatile irrespirable gas. It possesses strong alkaline properties. It turns red litmus blue and turmeric paper brown. It is only slightly inflammable, and stops the combustion of other bodies. It is composed of two volumes of N (nitrogen) and 6 of H (hydrogen) ; air being taken as unity, its specific gravity is 0·5893. Ammonia is to be met with in many organic compounds, both vegetable and animal. There are two modes of making it, one during the preparation of animal charcoal (in the destructive distillation of bones for the char for sugar refiners), and another during the manufacture of coal gas. The gas liquor is run into a retort, some slaked lime is added, heat is applied, and ammonia distils over ; this is again redistilled, in nearly the same way as alcohol, until it is pure enough for food. In use by confectioners, there is a great difference in the mode of its decomposition—other carbs require moisture, heat, and an acid to help to evolve gas. Ammonia is decomposed by heat, which disunites its chemical composition—the ammonia flies off, carbon dioxide gas is generated, and raises the goods. Carbonate of ammonia varies very much in its composition ; like many other preparations, it suffers from indifferent makers, varying in quality from 30 to 50 per cent. You will perhaps have noticed that biscuits or small goods, in which it has been used, sometimes smell strongly of it when coming from the oven. This may happen from an overdose that has not been neutralised by the heat of the oven, but in some cases it occurs from the ammonia being inferior, and you should mention it to your wholesale druggist. Buy it powdered ; it is much easier to use.

Glycerin is of great value in cake-making, because it does not dry. It will not evaporate until decomposed by calcination. It is one of the fatty acids, with an alcohol base. It is a product separated during soap-making. The soda ash or other alkali is mixed with fat and water, and boiled, and the fat alkali becomes

mixed into an emulsion, called saponification, and the glycerin is separated from the fat in the water, and is recovered by treating the waste or spent lye-water and alkali that does not enter into the soap, but settles at the bottom when cooling. Beneficent science has found and preserved this wholesome foodstuff, glycerin, for man's use.

Hydrochloric (*see* Bicarb. Soda) is separated in the manufacture of soda, ammonia in the manufacture of coal gas, and glycerin from soap. Wonderful is nature, and wonderful are the uses and power of science.

THE ESSENTIAL OILS, LEMON, etc.

These are sometimes mixed with alcohol to keep them bright and clear. Sometimes with fatty oils, resins, and fish oils, to cheapen them.

Tests.—First feel; pure oils are rough and dry between the fingers; impure oils are greasy; pure essences, when a spot is dropped upon paper and put into oven, evaporate, scarcely leaving a stain upon the paper; fatty oils will not evaporate, they leave an oily deposit. This is also the case when distilled. Put a little in a small glass retort over a bunsen; the essential oil distils over, impurities remain. Put 5 c.c. of the essence into a test tube, add 1 c.c. of pure sulphuric acid; the higher the temperature in samples tested, the more impure the essence. Rape oil rises to a 100° F., olive oil, 68°. Try the essence and fix a standard for heat; put 10 c.c. of the essence into a test tube, and drop a piece of sodium (*be careful with this, it explodes when in contact with water or air*) the size of a small pill into it; if it is impure, the sodium will dissolve with effervescence; if pure, it will not. If alcohol is in the essence, it is detected by putting into it a small piece of calcium chloride ($NaCl_2$); alcohol dissolves this, and it remains as a precipitate. To get percentage, this test should be performed in a small graduated test tube, and the amount of precipitate read off.

If fish oils are present, they can be detected by the development of a red colour when boiled in a caustic soda solution.

Ginger is the root stock of a small plant. Its odour is due to an essential oil, its hot taste to a peculiar resin contained in it. It is frequently tampered with; its essential ethereal oils, being abstracted by immersing in alcohol, which absorbs; this is taken away, and the ginger redried and sent to market, the essence so obtained being the best for mineral waters; it is clear, not cloudy.

Analysts have a difficulty in proving that ginger has been half spent that way. Dr. Barker-Smith's method in this book is a good test for strength, and also for the other essences. There are three sorts usually on the market: Cochin, African, and Jamaica. Jamaica is strongest, but darkest.

STOCK-KEEPING.

FORMS from which to ascertain Averages, Percentages, Gross and Nett Profits, Amount earned by Labour, Waste, Misappropriation, etc.—In a bakery, the first of these forms in the order of importance will be that dealing with flour; and as weekly is convenient, that period is taken and averaged at cost per sack, exclusive of labour.

FLOUR IN STOCK AND CONSUMED DURING THE WEEK.

DATE WEEK ENDING	NAME OR MARK OF FLOUR.	STOCK LAST SATURDAY.		ADDED DURING THE WEEK.		NOW IN STOCK, SATURDAY.		QUANTITY CONSUMED DURING WEEK.		AT WHOLESALE PRICE per 280 lbs.	TOTALS.		
		Sks.	Bshs.	Sks.	Bshs.	Sks.	Bshs.	Sks.	Bshs.		£	s.	d.
Saturday 1st.	Whites......	20	0	0	0	9	2½	10	2½	32/-	16	16	0
	Supers	15	2½	0	0	7	0	8	2½	34/-	14	9	0
	Households..	25	2½	0	0	19	2	6	0½	31/3	9	10	7½
	Hungarian ..	5	0	0	0	4	2½	0	2½	40/-	1	0	0
	Patents......	10	0	0	0	7	0	3	0	36/-	5	8	0
	Seconds	5	0	0	0	3	0	2	0	29/-	2	18	0
	First Grade Bakers....	10	0	0	0	6	0	4	0	30/-	6	0	0
	Odd Marks..	7	0	0	0	4	0	3	0	32/6	4	17	6
	Meal	3	0	0	0	2	0	1	0	29/-	1	9	0
	Cones or Rice Flour.....	3	0	0	0	2	2½	0	2½	25/-	0	12	6
TOTAL FOR THE WEEK—Flour		..	..	..				39	0½	COST	63	0	7½
” ” ” Yeast		..	..	..				..	..	”	1	3	7½
” ” ” Textis		..	..	..				..	..	”	0	9	9
” ” ” Salt ..		..	..	..				..	..	”	0	3	3
” ” ” Fuel		..	..	..				..	..	”	0	13	0
											£65	**10**	**3**
THE COST PER SACK—Flour ..		..	..	.				..	..	..	£1	4	0
” ” ” Yeast ..		..	..	..				..	..	..	0	0	7
” ” ” Yeast Food		..	..	..				..	..	..	0	0	3
” ” ” Salt ..		..	..	..				..	..	..	0	0	1
” ” ” Fuel ..		..	..	..				..	..	..	0	0	4
											£1	**5**	**3**

FLOUR IN STOCK AND CONSUMED DURING THE WEEK.—*Continued.*

DATE WEEK ENDING	NAME OR MARK OF FLOUR.	STOCK LAST SATURDAY.		ADDED DURING THE WEEK.		NOW IN STOCK, SATURDAY.		QUANTITY CONSUMED DURING WEEK.		
		Sks.	Bshs.	Sks.	Bshs.	Sks.	Bshs.	Sks.	Bshs.	
Saturday 8th.	Whites......	9	2½	5	0	6	2½	8	0	
	Supers	7	0	10	0	11	0	6	0	
	Households..	19	2	10	0	7	2	22	0	
	Hungarian ..	4	2½	0	0	3	0	1	2½	
	Patents......	7	0	0	0	4	0	3	0	
	Seconds	3	0	0	0	1	0	2	0	
	First Grade Bakers....	6	0	0	0	3	0	3	0	
	Odd Marks ..	4	0	0	0	1	0	3	0	
	Meal	2	0	0	0	0	0	0	0	
	Cones	2	2½	0	0	0	0	0	0	
		TOTAL ..		..		..		48	2½	

NOTE.—Cones or rice flour used in dusting must be taken in and charged against the cost—as shown above—having been used in the production of the loaf. This method of taking flour stock will show the quantity and the kind, and by carrying out the price of each sort, adding up the whole and dividing by the number of sacks, will give the cost per sack. In the second example is shown the method to be employed for carrying forward from week to week; the quantity in stock is entered in the column under the heading of *Now in stock;* and if any flour has been added to stock since the previous Saturday, put it in the column under the heading *Added during the week.* Each sort must be entered in the line with the name of that flour; you then strike the balance between what was and what is in stock, and in the quantity missing you have quantity consumed. Carry the totals now in the stock column down under the head of *Stock last Saturday*, and that will form the base to work from next Saturday. Having previously ascertained the profit per sack at the price you are getting, and the weekly expenditure for salaries, fuel, light, rent, rates, and taxes, you will see how much profit you have made during the week.

To ensure accuracy in these weekly flour returns and averages, it is necessary that the flour stock taken on Saturday be absolute, and not approximate; to this end, the baker must arrange that small odd parcels of flour in troughs or sacks be used up as far as convenient for Saturday's bread. All flour used by pastry-men, scaled and sent out, or otherwise, must be deducted from week's totals before averaging for cost per sack for bread; and further, especially note, a week's averages may be entirely upset by the non-delivery of a couple of bags of flour. In many places no person has charge of the flour-room; the door is opened, and the flour-carrier is left to put the flour in how he thinks best; and if the place is fairly full, or he has brought a lot, unless some person takes account at and during the time of the delivery, it is difficult to attempt it afterwards. Another particular note: the buyer of flour, for a large modern business, will usually know the quality of flour, independent of the mark on the sack; and frequently flour will be so bought and sent in that those who use it do not know its quality; therefore a weekly form must be issued bearing instructions as to quantity and qualities to be blended for

the different uses—rolls, Vienna large bread, scaling up, etc. The storekeeper should also keep an accurate return of the quantity of flour scaled and sold. Scaled or sold flour must be deducted from the flour used before an average of the quantity of bread per sack is struck.

NAME OF DEPARTMENT, OFFICE, OR FACTORY. DATE.

BREAD ORDER FORM.

Please make and deliver to Bread-room or Shop, or No. 1 Round, etc.

NO. REQUIRED.	DESCRIPTION.	NO. MADE.	NO. RECEIVED.
	Plain Crummy .. 4 lb.		
	" " .. 2 lb.		
	Cottages .. .. "		
	Bricks—Notched .. "		
	Brunswicks .. "		
	Whitepans or Tins "		
	Wholemeal .. .. "		
	Milk .. .. "		
	French .. .. "		
	Belgian .. .. "		
	Sandwich .. .. "		
	Collaw .. .. "		
	Twist .. .. at 2d.		
	Cobs .. .. " 2d.		
	Cakes .. .. " 1d.		
	French Rolls .. " 1d.		
	Dinner " .. " ½d.		
	Vienna .. .. " 3d.		
	Vienna .. .. " 2d.		
	Vienna .. .. " 1d.		
	Rosettes .. .. " 1d.		
	Crescents .. .. " 1d.		
	Queen's Bread .. " 1d.		
	etc., etc.		
Total Number			Total ....
2-lb. White Loaves..			
Wholemeal			
Pence inclusive		Signed for Bakery.	For Storekeeper.
		....	.. ..

NOTE.—It is urgent that this form be accurately filled in, signed, and taken into the office as soon after the day's bread is made as possible. The above form can be altered or amplified to suit the trade; plenty of room between lines should be allowed to fill in the figures in the bakehouse; every pennyworth of bread made should be put down, and at the end of the day, week, or month, taken with the flour stock for that time, should give the exact average per sack turned out.

To facilitate the making up of this nightly bread order form for the bakehouse, each porter or carman taking out bread

should fill in the number of each kind he requires opposite the name printed upon a slip corresponding with the articles printed upon the bread order form. The clerk, whose duty it is to make up the bread order, will copy these totals with the total ordered by shop, and add them together, which will be the quantity required.

To find Average per Sack. — In the bread order form already given, an exact return of all bread made has been recorded. To obtain the average number of 4-lb. loaves per sack of 280 lbs., reduce the number of 4-lb. loaves to the same number of parts as the number of sacks emptied. If there have been 10 sacks emptied, and there are 1,000 4-lb. loaves, that will be 100 per sack.

Bread Order for Bakery. — This form is drawn to connect the shop with the bakery, and also the bakery with the flour-room. The total number of each kind of bread required should be filled in opposite the name, and handed to the foreman at the beginning of each day's work, and having entered the exact number made at the finish of the day's baking, sign for the number made, and return the order to the office. He should endeavour to make the number ordered within a few loaves, which he will be able to do if he has given the necessary attention to the instructions given, and measures his water by the quart or gallon exactly, and not by guessing so much in a pail or tub. Have an exact measure of water, weight of flour, and ordinary care in dough-making will keep the quantity near enough. It is important that the number ordered and made should be closely watched, and serious differences more or less should be marked against the maker. Random making will not be allowable in a modern bakery. The bread order form when taken into the office should be used to check, first, the sales—if 1,000 are made, 1,000 loaves should be accounted for at the end of the day; second, the totals be totalled once a week, and all the small bread reduced to loaves and added to large bread totals, and that will give the total bread made during the week.

If any article, whether cakestuffs or breadstuffs, sold is strictly for cash, a simple form will be sufficient to book in from, but care must be taken that every customer's name and address is entered in a book, kept at the bakery, so that in the event of a carter meeting with an accident, it will be possible to send another on the round. A roundsman is also a very useful addition to the staff. He should be acquainted with all rounds. A daily register of every added name, and of every name taken off, should be an imperative rule, so that in case of

the loss of a customer the why and wherefore may be ascertained, and the possibility of recovery be considered.

To prevent — or hinder — the present wholesale filching of customers by roundsmen and canvassers, bind each by an agreement not to *solicit* the customers served by them for you, after leaving your employ; such customers having been obtained by the use of your name and money, and for which they have been paid.

Check Form for Raw Materials. — The manufacture and sale of cakestuffs is receiving at the hands of present-day competition the same treatment as that accorded to the making and selling of breadstuffs, and must be carefully conducted through every stage and detail of the process. Less waste of raw material and stale, a more modern adjustment of profits and an

MATERIALS FORM.

To be filled in, and when checked and initialed by the receiver, to be returned to the office.

	FLOUR	BUTTER	MARGARINE	CASTOR	RAW	CURRANTS	SODA	CREAM OF TARTAR	MILK	EGGS	SULTANAS	JAM	PEEL	AMOUNT PRODUCED IN SHILLINGS AT SALE PRICE
Scones	lbs. 21	lbs.	lbs. 3	lbs. 2¼	lbs.	lbs.	ozs. 5	ozs. 10	pts. 11	No.	lbs. 2	lbs.	lbs.	15/-
Lunch Cakes	9		3	3¾			¾	1½	4½	30	3		½	18/-
Pastry	3½		3					¼		2		1		9/-
6d. Wines	9		3	4			½	1	2	9				9/-
TOTAL *Used and Earned*	42½		12	10			6¼	12¾	17½	41	5	1	½	51/-

actual, not approximate, knowledge of the cost price of every article is urgent. Bakehouse tradition, trade usage, present price, must be very carefully considered before being followed; ordinarily they represent too much of the past, and not enough of the present; at their best they do but resemble an old well-worn vehicle, obsolete and past service. The annexed form, if firmly adhered to, will show the cost of the raw material, how it has been used, and where it should have gone to.

This outline will explain itself; names of goods can be increased or altered to suit the work in hand. The totals at bottom of columns of material used will give the amount to be credited to the workmen. Paper, colouring, flavouring, etc., too small to be estimated on the article, must be added to the gross cost of the day or week's produce, before striking a balance for profit.

The storekeeper, or other qualified person, will credit pastry-cook with these totals in the stock book, and the office will enter the total of work done, for the purpose of ascertaining how much the workman has earned during the day or week. The cost of labour will be conveniently ascertained at the end of the day, week, or month, by totalling produce column, and making an average. If, at the end of day's work, £5 worth is the total of goods turned out by man and youth, and their hire has cost 10s., then 10 per cent., or whatever is the actual percentage, must be added to the cost of the raw material, and will then give gross cost of production.

The store will open a debit and credit account of quantities with the head baker, pastry-cook, confectioner, or *chef*, entering to him butter, sugar, eggs, etc., as required; and at the end of day, week, or month, the total of goods used—taken from materials form—with any balance of material he may have in hand, should make up the amount given out from store. Comparing these totals with invoices will also control the storekeeper.

Every item must be put down to the debit of the user—wafer paper, paper used in bands, bottoms, or wrappers, essences, colouring, chemicals, and also small tools, cutlery, knives, spoons, moulds, etc., etc. The most stringent rules should be enforced in regard to this matter. The workman will not, has no right to, object; if he is to receive liberal payment, he must take a more intelligent interest in the economy of his tools and materials. "I don't care" will have no place in modern arrangements either side. Some workmen may object to give his recipes by putting down all the items used, and properly so, if it is this knowledge which gives him his special value, and is a revelation of what he regards as his private property; though to withhold this informa-

tion may be legitimate, it is not convenient, and must not be permitted; this private property in recipes must either be bought by the firm and added to their stock of standard formulas, or the goods must not be made. It is not expedient to push goods that depend upon a perpetual continuance of employ for their out-turn, or that will nullify the rules of the firm. There should be given printed sets of standard formulas for all work under the control of the confidential clerk. It must not be expected that the workman will make up these forms; his time is worth more to the firm. A sharp lad, possibly one of those helping (the apprentice or improver) will, during the work, and under the supervision of his chief, count or weigh up the goods, as they are made, and with pencil write down by dictation the quantities of material in them. The amount of goods sent to packing-room or shop must be checked by the receiver, who then becomes answerable for them (see form for salesman). These materials forms should be sent into the office, and occasionally checked as to percentage; and any departure from standard, either in ingredient or yield, should be reported to the principal manager. If the sellers of small goods under the old *régime* had watched their stock of raw material, the yield of mixture and the time taken to make them, their idea of the great profit on smalls would have been different; upon some of the goods the profits are much too small, and upon others as much too large. With some *petits fours* and *gâteaux*, though representing 100 per cent. profit on the materials, the time occupied in finishing and decorating is so much longer in proportion to other goods that, when added to the cost of the material, the percentage of profit comes out even less than that on commoner cheaper articles.

It will not be convenient to check the manufactured article from the *chef* or restaurant in a lump, because goods from these departments are sent up as required—a cup of chocolate, cutlet, soup, etc. Therefore all goods required from them should be ordered by printed slip, bone, tin, or other ticket, bearing the cash value of the goods wanted in sale shop, or sent out. The *chef* should not send out any goods without these vouchers, as they represent the amount or value of the work turned out; and they should be kept carefully by him, to compare with the totals of raw materials sent him, and will show the total work turned out also, say weekly.

Sales.—Having made arrangements to provide for proper receiving and checking of stock, the class of goods to be made and their standard formulas, gross and nett profits, the debiting of the workmen with the materials, and crediting of same with the sale value or articles made, the estimates of the value of labour by the amount of work turned out, the mode and price

Date

THE SHOP SALES RETURN FORM.

GOODS RECEIVED IN SHOP OR SALE-ROOM TO-DAY.	DEBIT.	SALES ACCOUNT.	CREDIT.		DEBIT.	STOCK SUSPENSE ACCOUNT.	CREDIT.
	£ s. d.	By—	£ s. d.		£ s. d.		£ s. d.
506 Loaves at 3d.	6 5 0			Forward ..	15 14 5	By Stock	14 10 0
300 Pence Fancy Bread ..	1 5 0					Allowance on Stale and Depreciated Stock ..	1 4 5
Flour Confectionery ..	5 10 0	Shop Cash Sales	6 10 0				
Sugar Confectionery ..	3 10 0	Accounts paid in as per Cash Books	7 10 0				
Goods from *chef's* Department..	4 10 0	Paid in by Porters	3 10 0				
Mineral Waters	0 16 0	Credit Sales as per Day Book and Ledger ..	6 10 0				
Tea, 2/4 ; Coffee, 2/4 ; Milk, 2/6	0 7 2						
Chocolate, 3/4 ; Sugar, 2/11	0 6 3						
Mustard, 1/- ; Pepper, 1/- ; Salt, 6d.	0 2 6						
Brought over Stock Suspense Account	17 10 0						
	40 1 11		24 7 6		15 14 5		15 14 5
		Balance forward to Suspense Account	15 14 5				
NOTE.—Include here all goods received, whether own or other manufacture, taking care there are no omissions.		Include here totals of all Cash received and Credit Sales.					

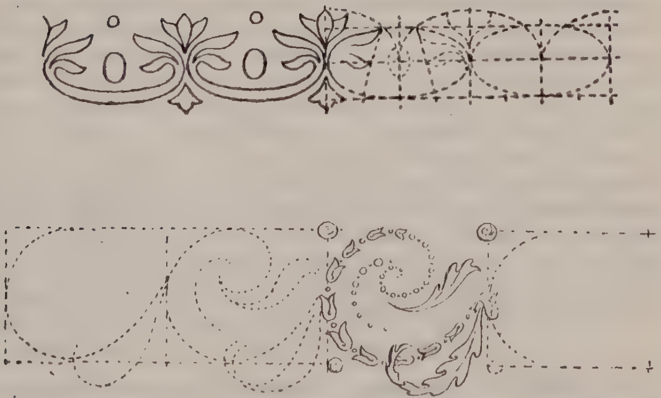
of sale, etc., it is now necessary to trace the produce until it is sold, either by being entered in the ledger to the debit of a customer's account, or (and much better) the cash for it is, through the medium of the paying-in book, safely entered to the credit of the firm's account in the banker's books. This tracing will be done by having a form to regulate shop and other sales, as per the following example, modifications of which to suit the different styles of business will adjust the details during the working: *A thing that it is necessary to do will itself suggest a way; not the only, or the best way, but a way according to the foreknowledge or instinct of the person devising it—and sufficient for the purpose.*

In a mixed trade there is a twofold hindrance to a daily checking of accounts, namely, stock-taking, and "stale" and waste. The cost of labour involved in too frequent stock-taking of candies, biscuits, and confectionery is considerable. The stale goods, though depreciated, will realise a part of their value a day or two hence, and this part must be accounted for at some time. Believing that a monthly stock-taking and settlement between departments will be more desirable in view of these difficulties, and that in most cases it will be quite as safe and undoubtedly cheaper, I have drawn this form, based upon a period of time, whether of one, two, three, or four weeks, to suit the style and extent of trade, or preference of managers, and which will fit in with the arranged time of balancing the workmen's output values.

The working principle of this form consists in the consignment of all goods to be sold direct to the seller or sale department at the usual sale price, keeping a debit and credit account, with a periodic stock-taking and balancing up. The stock suspense account is opened for the purpose of carrying forward the amount due on unsold and accumulating stock, which amount should be balanced by the stock in hand at the time of stock-taking, except, say, a 2½ per cent. allowance for deficit lost upon the sale of stale or depreciated goods. With this waste allowance must be taken the reductions granted to purchasers taking quantities; but such reductions, when possible, should be taken off the sale price or workmen's totals form, and not charged to sale-shop, and therefore would not require to be taken off; also when goods are damaged in making, *the price they are expected to realise*, not the usual sale price, should be entered in the workmen's totals as the price to be obtained for them. This will put the loss where it ought to be—upon the maker of it, the workman, whose totals of work done will be that much lower. The manager or principal will not always see the goods made, and these totals will be most valuable

to him at his daily, weekly, or monthly inspection of them in pointing out the useful from careless men, and will also be an incentive to the workman who knows he is to be judged by results.

When the sale shop is divided into departments for the sale of the different goods, it will be quite convenient to have separate tills and separate accounts for cash, and obtain an accurate return of the profits on them; but when the sale shop is not so divided, it will not be so convenient, and the keeping of separate tills need only be resorted to when it is necessary to trace the source of a suspected leakage. When it is desirable to do so, book to each its own peculiar goods, keep a separate till, and open a debit to credit and suspense account for each as per form. This dividing into the different tills will be strange at first starting, but will become quite natural from use; as I have said, a thing necessary to be done should be done, and usually *can* be done.



Copy for Piping Practice.

HINTS AND NOTES.

THE saying that nothing succeeds like success, to make it intelligible, should have the addendum—when it (success) means honour or money-getting, for where is the reward as an outward and visible sign attending the successful straightening of the hereditary twist in the moral character—the poverty bequeathed by ignorance turned into intelligent knowledge—the entering into combat with the selfish and brutal in our nature, conquering it and putting in its place the grandly beautiful character portrayed by Professor Huxley: "The man who has been so trained that his body is the ready servant of his will, and does with ease and pleasure all the work that, as a mechanism, it is capable of; whose intellect is a clear, cold, logic engine, with all its parts of equal strength, and in smooth working order, ready like a steam engine to be turned to any kind of work, and spin the gossamers as well as forge the anchors of the mind; whose mind is stored with a knowledge of the great and fundamental truths of Nature, and of the laws of her operations; one who—no stunted ascetic—is full of life and fire, but whose passions are trained to come to heel by a vigorous will, the servant of a tender conscience; who has learned to love all beauty, whether of nature or of art, to hate all vileness, and to respect others as himself?" Is not this a stupendous success! Brother, baker, confectioner, miller—hampered with a consciousness of the lack of education, and worse, the possession of a nature mentally indolent, selfish, and perhaps brutally coarse—herein and elsewhere seek for stimulus and help to circumvent and overcome these defects. It is of no consequence whether the outside world says "successful" to you or not, your concern is to get the "well done" at the finish of the journey from the man inside your own breast.

Technical Education: What it is, and How to Obtain it.—Technical students, to be worthy of the name, must be students in reality, not in fancy. They must acquire a theoretical and practical knowledge of that part of chemistry which applies to their craft. To achieve this, it will be necessary to learn at least the rudiments of general chemistry, nor should this fact hinder the most timid from undertaking such study, for what is chemistry but the means by which we get to know, to examine all bodies which act upon the senses. It helps us to determine

the properties of all animal, vegetable, and mineral substances; to determine the constitution of the atmosphere, of the water, and of our raw materials. The laws of hail, snow, ice, dew, and rain, chemistry explains to us. Most of the processes in bread and confectionery making and the cooking of food are chemical operations, and knowing the chemistry of the process is to know the why and wherefore of it. Chemistry explains to us the reasons of the changes effected by heat, how substances in combination are to be separated, and how the union of substances and the formation of new compounds are effected. Nor is chemistry dry and altogether serious in its study—if you buy one of the books on chemical recreations, you will get many hours of real amusement out of it. The recreative interest in experimental research, production, and demonstration has only to be pursued to be enjoyed. The occasional and unexpected explosion or flame, with the resulting singed hair and scorched flesh, will give you something to think and talk about for many days.

Chemical science has no politics and knows no side. It is a science of fact, and a study of it will teach us to be exact and accurate in our sayings and doings, and is just the sort of education needed at the present time.

The bread-making technical student must also dive a little into botany and biology, for how can he know what yeast and its functions are without knowing something of the fungi family, their nature, uses, influences, and structure? Bacilli and bacteria are the baker's constant companions; he must become acquainted with them very intimately, so as to entertain them properly (for they are useful guests sometimes), and to teach them not to outstay or take liberties with their welcome.

The baker and confectioner, to be quite sure of the degree of the boiling sugar, the heat of the baking chamber and liquids, must let go the cumbrous and uncertain testings of rule of thumb, and take to the thermometer, and therefore must read books which treat of heat and temperature.

Nothing is to Small to Teach or to Learn.—It is only relatively that any man is wise or foolish. There may be those who do not know quite so much, but there are also those who know much more than we do. It is no disgrace for the oldest workman to be willing to be taught that which he does not know, or that may not have come within the scope of his experience. It must be remembered that a complete knowledge of the baking and allied trades of cooking, confectionery, and cake-making cannot be acquired fully in a lifetime; there are fresh creations every day, and the young man who is widest awake usually finds out or acquires the most extensive and varied information.

Therefore keep your eyes open, and cultivate quickness of perception and smartness of action; and if you do work out something new, don't let it die with you, give it to the trade—many a useful improvement dies with its possessor, because he is jealous of another knowing as much as himself; when you teach, you make a path for others to walk upon.

"**Knowledge is Power**" in the workshop, as elsewhere. The more extended and varied the better. The workman should have his head full of information about his work, so that in the moment of need memory or reflection can bring out just the knowledge required to perfect the work in hand. But knowledge or natural gift, be it ever so great, will not suffice. If a workman wants to take the front rank in the trade he must have more than these—he must have right principles to go on; principles are to character what concrete bottoms are to buildings. To have a solid character there must be a solid foundation; therefore have a good governing principle, a rule that shall be the plumb-line, by which you will be able to see if any act is out of the *square*, or such as would interfere with your determination to walk uprightly. Make up your mind at the start what is to be the object of your life; don't be like a cork on the water, blown hither and thither by every wind, and at last safely landed in the corner of some muddy creek. Don't leave chance to make your future—that trust is vain. If you expect to attain honours you must first work to win them. Don't be heavy-hearted and doubtful of success; persevere. Inexperience and youth are followed by ripeness and wisdom; the scholar of to-day is the teacher for to-morrow. Don't fail, when you have obtained useful knowledge, to impart it to those around; "imparted knowledge does not diminish learning's store." Cultivate self-government, let "patience have her perfect work, be not hasty in spirit to be angry." Don't browbeat your brother workman if you have occasion for the expression of a different opinion or to administer rebuke; do it with firmness and moderation. Employers, do not browbeat and bully your work-people; a tyrant who drives and curses seldom has faithful servants. The obstacle in the way of strikes is a kind employer; but if he ignore the remembrance that the operative is also a man like himself, with the same needs of flesh and spirit, the same duties of husband and father in providing food, clothes, education, and habitation; if employers neglect the display of humanitarian principles, then though they be wise business men, though they be progressively successful business men, they are also progressively successful brutes, promoters of strikes, and aiders and abettors of drunkenness, profanity and crime, for men treated as beasts become beasts; kindness is a strike antiseptic—*Be Gentlemen All.*

Be Clean.—Every workman who has any proper pride in his work, or who would be counted a true workman, will be clean in more senses than one—clean tongue, clean flesh, clean utensils, clean work—for if a little loose flour or "cones" were allowed to adhere to the loaf his work would be badly finished, and he would be deemed untidy; but how much more would this be the case if he were dirty in his person, and touched the dough or batter with unwashed hands! Every time he did so touch it, it would not only be abominably dirty, but he would also spoil his work, and of course frustrate his future preferment. A man who would come from handling the tins, the peel, or the scuffle, etc., to mould any of the fine fancy breads—such as crescents, twists, Vienna rolls, or any clear "green" dough—would spoil them for appearance and for eating. Watch him closely, or keep him to wait upon the others and do the drudgery. Dough will clean out the interstices in the hands in such a way that any decent workman will use plenty of soap and water if he can get at it. Cleanliness *is not* next to godliness in any other sense than being a good habit; or any nearer than honesty, charity, etc. Cleanliness is, however, one of the good habits that are essential in connection with food; therefore clean habits always form one of the planks of a good character, which, when engaging a man, should be as much sought for as honesty itself.

Bakers and Confectioners should have good "Understandings."—Old boots "try" the feet very much; don't wear them in the workshop. If a workman is bad on the feet it will impair his usefulness. In the fabrication of bread he has no idle members—head, hand, heart, and foot are all under contribution at one and the same time. Old shoes and clothes are not only uncomfortable, but they are untidy, and do not enhance the value of the workman. It will not cost much to have a light material neatly made up for bakehouse wear. Consider, too, that a baker spends two-thirds of his waking time at work, under very heavy pressure; surely, then, some special provision should be made for good and suitable clothing for that "two-thirds of his waking life." Baker and confectioner, wear the working dress that will dignify your calling, not degrade it.

"**Keep Time.**"—Few things tend so much to create contention as irregularity in the order of work. Backward work has to answer for much unparliamentary language in the bake-office and shop. The clock should be large-faced, and hang in a prominent place. A workman who "takes pride in the work," and desires the goods to be up in time, will instinctively watch the clock. Gossip, joking, retailing the news, and argumentative discussions are alike out of place when there is a lot of work about; when this is indulged in, and becomes general, it is a dead certainty

whether "the favourite wins" or not, that the goods will be half an hour late at the finish. Always be "on time."

Pins and Nails, pieces of wood and stone, are very bad things to digest, and, moreover, are not at all conducive to longevity; therefore pins should be strictly forbidden within the precincts of the bakehouse. Should "rents" occur and buttons come off, seek the assistance of some kind mother, or use string or sack tyers, but, if you please, no pins; neither should boxes of peel, currants, or sultanas be opened nor sifted and picked upon the dough-tables or trough-lids, or it will be nearly impossible to prevent some of the débris, nails, etc., getting into the cracks and falling through on the flour or other raw materials that are about.

The System of Business for Progressive Men. — Price, Credit, Canvassing are questions the understanding of which need give you no anxiety, as they will have no place in your business. You are proposing to open a bakery and run it upon progressive lines, upon the assumption that there is room for it in that particular town or district; and regarding the price at which to sell, your wisdom will be to adjust the mode of trade and sale, so that the turnover at the end of the quarter or half-year will show a fair profit on expended capital and brains, and the price must be adjusted to give that fair profit; you have no right to more, and should not be satisfied with less. "Money" should not expect more than four or five per cent., and labour as working master should be charged for at the amount it would be worth in the labour market as a manager.

It is preposterous to expect, as many do, a fortune from the investment of a few hundred pounds. If you invest £5,000 and also work personally in the business, you should expect, and have, £200 per annum as interest at four per cent.—being a safe investment—and £250 as salary, which will be as much as the manipulation of £5,000 is worth. This will give £450 for capital and management. I would not send out convassers or buy customers by "tipping," simply because it is wasteful, not because there is any impropriety or sharp practice attached to these trade customs. If your bakery succeeds in the purpose for which it is opened—that of attracting trade—it will be by displacing some of the existing baker's trade. *Every gain of a customer means the loss of a customer.* There is quite a lot of nonsense talked about canvassing, objectors forgetting that the increase of business in their own case could only have been obtained by taking it from other bakers. If they have not canvassed for it they have had no need to do so. The favoured position of their shop, the natural grace of their person or the superior quality of their goods—underselling in quality, as it is termed — have, in their case, rendered canvassing

unnecessary. To send a card in to a lady and to solicit an order to supply her with bread is in no degree less respectable or praiseworthy than the calling of the flour seller upon you at your shop to solicit an order for flour. Many traders who sneer at the practice of canvassing for customers in their houses have no objection to canvas them as they pass along the street by an enormous show of goods and well-dressed windows, which will result in waste and stale goods, to be sold next day at less than cost price.

The only forcible and sound objection to canvass for business by miller or baker, or to the sale of waste and stale goods, is that it must add to the sale price of the article. It is therefore unsound, and should not be practised. For the same reason, I consider the Credit System is also unsound, and must not be a plank in a progressive baker's platform. It handicaps progress very severely. In the ordinary family baker's trade the amount of locked-up capital is from 8 to 10 per cent. of the entire turnover. If the annual turnover is £5,000, taken at an estimate of 7½ per cent., £375 will be wholly unproductive by being always upon the books as current credit accounts. It does not affect the calculation whether the credit given is one week or more. If paid every week, the current week is being put on the books at the same time the past week is being taken off. To put it roughly and in round figures, if you total up the amount unpaid on an ordinary "family baker's" ledger, the turnover being £5,000 a year, on any and every day of the year, you will find not less than £400; in many cases it will be over £500. To put the case yet more strongly, for every £100 worth of trade done, you are only able to handle and use £90 of it, considering the power of cash to buy is 2½ per cent. off in most cases, and that in the baking trade, where stocks are turned over at least every three months, which will make this 2½ into 10 per cent. for the year; 10 per cent. on £500, the sunk or locked-up portion of the turnover will be equal to 1 per cent. on the total turnover of £5,000; now add 2 per cent. for the cost of clerical work of this credit trade—it cannot be well done cheaper—and 2 per cent. for bad debts and actual money outlay for stationery, and you have as absolutely the minimum cost of a credit trade, a clear loss of 5 per cent., which is tantamount to the loss of every cent. to which the invested capital is entitled, and every pound paid out of the business to invested capital has been a pound unnecessarily put upon the retail sale price, the retail cash buyer having had to pay in excess of the fair value of the loaf. In the majority of credit shops the person who buys direct from the counter puts the cash down, and—without the sometimes grudged piece of paper for wrapping—takes away the loaf, pays exactly

the same price as that charged when it is sent a mile, and the account for it is sent in and brought forward on the ledger several times before it is paid for.

C. O. D. is the only form of payment allowable in a modern system of business, especially a baker's business. A loaf of bread or a cake is not like a shovel or hammer, or even like boots and coats; all these things take some time to wear out, but a loaf is consumed at once, and like a ride in train or 'bus, cannot be recovered, and therefore should be paid for on the spot. Ready money buying, if used with care, will always obtain the best value, wholesale or retail. It is because bakers think they can hold their customers surer that they like the credit family trade, and being sure of them are tempted to *make them pay*. But the days of harvest in this respect are rapidly passing away, for ordinary buyers are beginning to understand the value of ready money, and the power of choice cash buying gives them, and the credit baker is becoming what the credit grocer has already become, merely a convenience for the needy and a mark for the swindler. It does not involve the possession of a knowledge of mathematics to know that if a baker can afford to send a 3d. loaf a mile, enter the transaction in at least two books, send in an account and wait a month for the money, he ought to be able to supply it for less to the person fetching and paying cash for the bread; thus saving cost of books, bills, wear and tear of baskets, barrows, carts, loss on the amount of locked-up capital, and worse—the actual loss of money through bad debts.

The glamour which Credit Trading seems to throw over well-informed business men is not understandable by ordinary reasoning; though they have a forcible object lesson confronting them in the firms analogous to their own in product, who are obviously going straight and quick towards the prize of a big business and a big annual income upon a cash system, yet these smart business men allow themselves to slowly drag behind in the old-fashioned credit coach. Credit is a most hideous monster, conceived, brought forth, and kept alive by ignorance. It is more destructive of nett profits than the greediest of lessors and ground landlords, the shortest and worst of repairing leases, and the most exacting of strikes. This is the "bloated aristocrat" who, gorged upon bad debts and the work of clerical departments, sits upon the chest of interest and principal, absorbs the reserve fund, and causes perpetual nightmare to traders; that preys upon the vital energy of commerce, and wastes it; that keeps large numbers of capable people employed with the sole duty of feeding its hungry maw with bills, invoices, statements, postings, and writs. But notwithstanding all this, notwithstanding that those who have driven this credit fiend away have "mounted up with

wings of eagles," have reached the prize quickly, notwithstanding that the dead and the dying victims of credit lie thickly everywhere, that such numbers of the clever and beautiful of our youth are kept in bondage to his service, that he is the cause of suicides and lunacy, that bankruptcies are his doings, and that the underpaid workpeople are frequently the outcome of his greedy assimilation of profits, notwithstanding that he causes madness, severs friends, peoples the workhouse, the suicide's grave, and the madhouse, credit is still courted and welcomed by the majority of traders, is sought after—aye, and purchased. Woe is me, for I am undone, for I live in the days of the reign of King Credit, and mine eyes have beheld and wept over his victims; one would wish with Jeremiah to have fountains for eyes, that the continually flowing stream might attest the sincerity of my sorrow.

The Price of Bread.—The Press of England reflects not only the real grievances but the fleeting thoughts and fancies of the public mind. It is, therefore, quite natural to expect that the leisure hours of letter-writers should find expression in the columns of the daily papers on the price of bread. We do not think, however, that many of those who complain in print are genuine representatives of the working classes, though this circumstance does not deny them the right of discussing this or any other question affecting the interests of the poor, provided always that such amateur champions take the needful pains to acquaint themselves with the facts at issue, and that they *truly* represent a real grievance. Many of the daily and weekly papers, in their editorials, are but very little above these fugitive letters in the justness and accuracy of their remarks when attempting to fix the guilt of unjust prices upon the bakers—a body of men who, after all, occupy but the last, the most laborious, and consequently the least remunerative place among the classes who deal in corn and flour.

Outside the trade there is a dangerous *penchant* among literary men for settling questions of public interest by arithmetic; but it is just one of those ways of stating a case in which general readers should place but little confidence. We see a result, but do not see how it was arrived at, or whether the whole of the figures germane to the matter have been taken into account. For instance, it is a *fair-looking* statement to say "a sack of flour costs 25s., and produces ninety quarterns of bread, for which the baker charges 5d. per quartern, at which price it returns 37s. 6d., and allowing 6s. for cost of production and distribution, it gives 6s. 6d. profit." Yet this, notwithstanding the use of figures, is a very imperfect statement; but it is the usual way of putting the case, and would be conclusive were it not a fact that some of the

most important figures are left out of the calculation. The truth is, there are factors in the case that will not *dress up* into a sum of this kind. We will name a few of them.

Notwithstanding the most anxious thought and endeavours to anticipate the *probable* orders of his customers, the baker will occasionally make too much. Changes in the weather will affect the demand: a sudden flush of cheap fruit or vegetables in his neighbourhood which he could not have foreseen also reduces custom; and though he may clear out to-day, to-morrow he may find himself overstocked. Temperature must also be taken into account in the manufacture, as it affects the fermentation and sometimes spoils the entire batch. *This excess and waste bread must be taken into the calculation*; *all the ninety quarterns must be sold, and the money obtained for it, before the profits can be estimated.*

Flours are not all of one quality, and consequently there can be no uniform yield of bread; nor are they of one price, so there can be no uniform profit.

There are bad debts, wear and tear of plant, that must be tacked on to the cost of production, to say nothing of rent, rates, taxes, all of which must come out of this 6s. 6d.

Education, science, art, sanitation, and even philanthropy itself cost money, as ratepayers everywhere know too well; and bakers, among others, have to bear their share of the burden.

The price of bread is affected, as well as that of other commodities, by the vast number of persons in the world who "toil not, neither do they spin," though some of them pose as the advocates of a cheap loaf to wile away the time.

There is a law of compensation in trade as in nature by which prosperous years bear the burden of unprosperous. The farmer looks to a good harvest to recoup him for the failures of the past, but if the public are to step in and reap immediately the whole benefit of his good harvest, his former hopes would be nullified. The public should be regarded as partners in the profits and losses of their tradesmen, but not in the profits until the losses are adjusted or compensated for.

The present low price of bread has been reached before during the last twenty years, although the price of flour has never been so low; this simply means that an article may be sold at one time below its value owing to an excess of capital, production, or competition; *but the public are doomed to defray that loss sooner or later.* In the production of bread there are all these elements of excess: Among the financiers at the head, too much capital (or credit), limited only by the ability of the public to buy; among the millers too great a production—Rollers once started must grind on, even at a present loss, for which, however, the people will have to pay by-and-bye; too many producers; an

army of small bakers, the excess of whom the public must undoubtedly support.

This subject, for many years, has had expended upon it the anxious thought and tireless energy of a number of earnest, intelligent men, belonging to both the milling and the baking trades—men who have taken an unselfish interest in the moral as well as financial improvement of the trade; who have tried "moral suasion," "coercion," "purchase," deputations to millers and bakers *ad lib.;* and who have spent many weary hours in conference and council, advancing and refuting, pulverising and sticking together again, every argument that could be thought of, read, or written upon this question of getting a uniform price for bread.

With the memory of these efforts full upon me, I would not thoughtlessly intrude, nor must it for a moment be thought that I enter the arena to throw down the gauntlet and to join the combatants. I come with the basis of an armistice, with a flag of truce, and to persuade bakers to cease this barren fight—you do but "kick against the pricks"; this is but a question of cause and effect, which is paralleled in the "'bus," boot and clothing trades, in matches, in sugar, and in many other things, not over-looking labour and capital—the chief of all.

It may seem a little cold-blooded to talk of patience to drowning men, but nevertheless, as matters stand, patience is absolutely necessary; the trade has come into a rich inheritance, and everything connected with the milling and baking trades is in a state of transition. It is impossible to work upon the old lines: uniformity of price can only be thought of now upon a much wider basis; *there must be at least four standards of prices* to meet the values of the different varieties of flours—this is becoming quite plain to anyone who takes in the abnormal growth of the varieties or classes of flour. During the last fifteen years the difference of value is most marked—ranging from fourth grade or seconds at 19s. up to supers and patent purified middlings at 30s., and Hungarian at 37s.—and this difference is being *increased* every year. Before, therefore, we talk of a fixed price, these qualities of flour must be separated into *four* classes, to meet the demand that exists: (*a*) Among the very poor labouring classes; (*b*) the superior mechanic and tradesman; (*c*) the middle and professional; and (*d*) the upper aristocratic classes—each of these classes is well defined in their style of living, and their bread-supply could be easily adjusted.

Free trade has undoubtedly brought too many competitors into the home flour-market, but it is one of those good principles that, though they disturb for a time the social earth they are in contact with, it is only the disturbance caused by the breaking up of bad

concrete customs, and all will right itself by-and-bye for the nation's good. Though free trade has increased competitors, it will end in squeezing many of them out altogether.

In the case of ignorance of political economy, it will be necessary only to educate—educate—educate. There must be drawn up and printed, for the use of juniors and others taking shops, accurate tables, showing the true cost of production and distribution, inclusive of wages, rent, rates, taxes, insurance (life and fire), with light, fuel, repairs, wear and tear of *person* and plant, etc. Then we must have instruction how to "keep books," how to ascertain profits, how to find out the number of quarterns of bread to the sack of flour, and how many shillings a sack so much per quartern will return. There must be teaching of a higher kind as to the morals and duties of the trade, and young men should go to the Bakers' Institute to learn the technics as well as the practice of how to make and *sell* bread.

In connection with this question of the price of bread, it is my duty to tell these fugitive letter-writers, consumers, and the public press, that they are themselves chargeable with the loss of a farthing a loaf by their culpably careless violation of the economic law governing supply and demand.

I have said that one cause of loss to the baker which the public must pay for is that the baker has to make bread to meet *probable* orders. Mrs. Blank takes in three loaves from the man when he calls to-day, but to-morrow she does not require any; now what difficulty would it be for Mrs. Blank to have said she would not require any bread on the morrow? None whatever; and this causes needless waste of good bread, good bread which in large quantities all the year is sold for pigs' food, and won't even fetch that market sometimes, and has to be thrown away, and is therefore so much waste of profit. Again, have bread buyers any idea of the waste of profit there is in their habit of running up a bill? A paltry 2½d. loaf involving the whole paraphernalia of office, clerks, books, and the loss of another farthing. It is in just those circles where there is money that it is most difficult to get this 2½d. in ready money, and where the chief of the grumbling letters come from.

The consumer is also solely responsible for another profit-wasting as well as unwholesome usage, namely, that of changing stale bread for new. Mrs. Blank coolly says, "None to-day, baker, but give me a new loaf for this stale one," and is highly incensed if he demurs, though most likely he has more than he wants already, and it will only go to the pigs. Apart, however, from this sin of waste, I demand in the interests of the public health, upon sanitary grounds, that this unwholesome custom shall be abolished. The bread may have been handled by hands befouled with

unthinkable things, by persons suffering from acute phthisis, or taken from a damp, slimy pan or cupboard, positively reeking in *mucor mucedo*, *bacillus subtilis*, and *bacterium termo*, or from a room where the known or unknown presence of the bacilli of typhoid and scarlet fevers and smallpox are lurking. Ugh! the mere thought of it is enough to make one break through habits of abstinence and drink brandy.

Immediate reform in these various matters can be easily effected by a mutual agreement between the baker and his customer, and as the continuance of these abuses is inimical to the interests of both, it should not be delayed. If the Associations will prepare a circular-letter, and ask the help of the daily and weekly press to make it known, there will be no difficulty with the public, for it will not only mean cheaper bread to them, but also the saving to the nation of much valuable foodstuff for its people that at present finds its way to the dust-heap.

Bakers have only themselves to blame for much of this unreasonable press criticism, from the fact that they have no standard of gross and net profit, and therefore for the lack of such a recognised standard, bread that is made from the same value and quality of flour is sold at different prices in different towns, and at different prices in the different streets and districts of the same town. It is urgently necessary that such a standard should be at once attempted, nor is there apparently any sound reason why it should not be. A conference of delegates from the bakers' societies from all parts of the country could be expected to agree upon a fair standard of gross profit, and that standard arranged, a note sent to the press associations as to a rise or fall in the price of the loaf would, by the London and provincial press, convey the fact to both baker and public. The baker could be trusted to rise, and the public would look after the fall, and in a short time it would become as accurately automatic in its operation as that of the press quotations of stocks and shares. The severe publicity of this would act also upon bakers who would take any unfair advantage. For public opinion, when properly educated, is very sound, and few bakers would find it pay to face an adverse public opinion.

Something of this sort must soon be arranged by bakers, or the Government must do it for them, for it is obvious that their present mode of doing business cannot be tolerated in connection with an article of commerce of such importance to the nation as its daily bread.

Such a standard would also simplify the adjustment of the differences between the employer and the employed.

The following sketch of the outlines of a possible standard may perhaps suggest a way out of the maze :

Take as a base for a standard for household bread either 2nd patents or households; these, at the time of writing, are 25s. the 280 lbs. We will put the—

Price of flour, 280 lbs.	£1	5	0
Cost of labour to make into bread ...		3	6
,, ,, sell and deliver ...		3	0
Yeast, salt, and fuel		1	3
Rent and taxes		1	0
Wear and tear, fire insurance ...			9
	£1	14	6
Yielding, after allowing for waste, 90 4-lb. loaves at the present price of 5d....	1	17	6
Nett profit,	£0	3	0

Therefore the standard retail price for bread made with flour costing 25s. is 5d. per 4-lb. loaf. Whites and 1st patents being 4s. more per 280 lbs., would therefore be 5½d. per 4-lb. loaf as a standard.

It may be pointed out that 3s. per 280 lbs., as a nett profit, is very low, and not enough. In answer to this objection, I reply that a full allowance has been made on labour, which will leave the master very little to do, and if the output is only twenty sacks per week, that would bring in 60s., and that is ample payment for the very little mental and physical effort he has to put forth. If the master is energetic and does manual labour, he will displace some of this, and, of course, take the extra profit, which is his rightful due. There may be extra work and worry entailed by the making and selling of flour confectionery and other goods—quite so, but that has nothing to do with the loaf; they must bear their share of cost, and yield their own profit.

It may be objected, further, that there is no allowance for bad debts. Certainly not! Mrs. Blank, who pays cash, must not be asked to finance the loss through Mrs. Blink, who does not. You risk upon Mrs. Blink; make her pay ½d. more for the risk.

Nor is the sum for rent too small. It is quite enough if a fair trade is done; and if the baker takes a highly-rented shop, with but a small output, it is a bad bargain, and he must bear the loss of some of his 3s.; he has no right to make the public pay for exorbitant and fancy expenses.

The extra cost, too (to make), of small and fancy bread have nothing to do with a fair standard for the ordinary loaf; they do (or should do) return an extra price, to cover their own expenses and provide their own profits.

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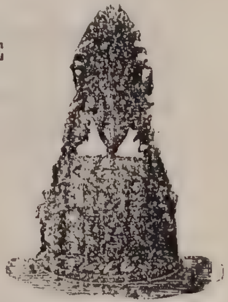

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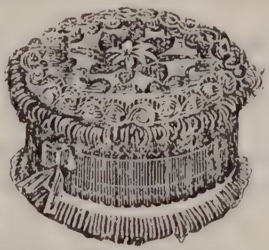

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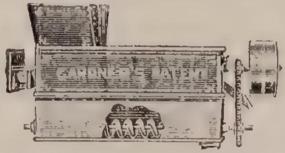

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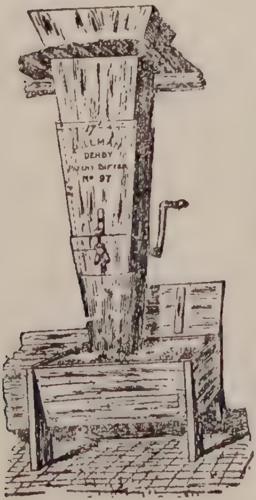

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